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# EAST EUROPEAN ECONOMIES: SLOW GROWTH IN THE 1980'S

## VOLUME 1. ECONOMIC PERFORMANCE AND POLICY

## SELECTED PAPERS

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# LETTER OF TRANSMITTAL

SEPTEMBER 18, 1985.

*To the Members of the Joint Economic Committee:*

Transmitted herewith for use by the Joint Economic Committee, Congress, and the interested public is a study consisting of a compilation of papers assessing the economies of East Europe entitled "East European Economies: Slow Growth in the 1980's, Volume 1—Economic Performance and Policy." Companion volumes containing analyses of foreign trade and individual country studies will be transmitted in the near future. This compilation is part of the committee's continuing effort to monitor economic trends in the Communist countries.

The present volume examines trends and developments on a regional scale. It evaluates the East European adjustment to changes in the international environment, and discusses industry and employment, consumption, energy, agriculture, and the defense sector. A general conclusion drawn from the studies is that the region will experience slow growth for the foreseeable future.

We are grateful to the Congressional Research Service of the Library of Congress for making available the services of John P. Hardt to help plan the study. Dr. Hardt and Richard F. Kaufman of the committee staff coordinated and directed the project and edited the present volume. Dr. Hardt was assisted by Donna L. Gold of the Library staff. We are also grateful to the many government and private specialists who contributed papers to the study.

It should be understood that the views contained in the volume are those of the authors and not necessarily those of the Joint Economic Committee or of individual members.

Sincerely,

DAVID R. OBEY,
*Chairman, Joint Economic Committee.*

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# POLICY HIGHLIGHTS: A REGIONAL ECONOMIC ASSESSMENT OF EASTERN EUROPE

By John P. Hardt and Richard F. Kaufman

The papers in this volume deal mainly with the six East European allies of the Soviet Union who belong to the Council of Mutual Economic Assistance (CMEA): Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. In addition, there is some discussion of Yugoslavia, which is an associate member of CMEA,[1] is located in the region, is a Communist system, and has close economic ties to the region. Albania, the smallest country in the East European region, has not been included because of the lack of reliable information about current economic performance.

## FROM RAPID TO SLOW GROWTH AND AUSTERITY

During the 1970's, the overall economic performance of Eastern Europe was probably the most impressive since the introduction of socialism into the region: not only was quantitative growth high, but there was also improvement in the quality of goods produced. Both the rate of investment and consumption exceeded the overall growth of production, made possible by an import-driven growth policy. This past growth of supply was buoyed by increased imports financed by favorable credit arrangements from the West and comparatively cheap energy imports from the U.S.S.R. In addition, the East European regimes subsidized consumption programs to elicit popular political and economic support by rising living standards. However, when economic growth slowed in the late 1970's, several countries had difficulty servicing their foreign debts and, as new credits were reduced or withheld, experienced numerous difficulties.

The future for each of the CMEA-Six countries and Yugoslavia holds not rapid economic growth but slow growth and austerity. Each of the countries faces difficult economic decisions on how to allocate the slowly growing supply of resources among pressing claimants. Consumer demand may be especially difficult to meet, despite the need for rising per capita consumption to sustain worker morale, provide incentives for higher productivity, and to ensure political stability. At the same time, greater investment is needed to modernize plant and equipment.

## ECONOMIC PERFORMANCE SO FAR IN THE 1980's

In general, there was a modest recovery in the region during 1984. In 1983, several countries seemed to some to be on the brink of economic crisis. The situation was considerably alleviated by last year's improvements. Estimated rates of GNP growth ranged from 1.3 percent for Hungary to 4.3 percent for Romania. Growth rates for the other four CMEA countries were in the 3 percent range, except for Czechoslovakia, which grew at 2.2 percent. Growth rates in 1984 accelerated over 1983 in each country except Poland. Its growth rate of 3.4 percent was the second highest but represents less than the 4.6 percent growth registered in 1983.

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[1] Associate membership status governs the affiliation of Yugoslavia since 1976, participating in 21 of 32 key CMEA institutions as if it were a full member.

The 1984 growth rate for the six CMEA countries averaged 3.1 percent. For the five-year period, 1980–84, overall growth averaged only 1.2 percent. This five-year growth rate represents a continuation of the slowdown in economic expansion for the region as a whole that began in the early 1970's. For the first five years of that decade, the six countries had an average growth of 4.9 percent; for 1975–80, the rate was 2 percent. Although Poland's large economic contractions in 1980 and 1981 brought the average for the region down somewhat (Poland's GNP declined in 1980 by 3.2 percent and, in 1981, by 6.8 percent), the other countries also had sluggish growth throughout the period.

TABLE 1.—ANNUAL RATES OF GROWTH OF GNP, SIX EAST EUROPEAN COUNTRIES, 1970–84 [1]

[Constant prices, percent]

| Country | 1970–75 | 1975–80 | 1980–84 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|---|---|
| Bulgaria | 4.5 | 1.2 | 1.6 | 3.7 | −2.8 | 3.0 | 3.1 | −1.7 | 3.1 |
| Czechoslovakia | 3.4 | 2.2 | 1.2 | 0.9 | 1.7 | −0.5 | 1.4 | 1.0 | 2.2 |
| East Germany | 3.5 | 2.4 | 1.3 | 2.7 | 2.4 | 2.0 | 0.0 | 1.6 | 3.0 |
| Hungary | 3.4 | 2.3 | 1.1 | 0.6 | 0.5 | −0.1 | 1.5 | −1.2 | 1.3 |
| Poland | 6.6 | 0.9 | 0.6 | −1.7 | −3.2 | −5.3 | −0.6 | 4.6 | 3.4 |
| Romania | 6.2 | 3.9 | 1.8 | 3.8 | −1.7 | 0.5 | 2.3 | 0.3 | 4.3 |
| Totals | 4.9 | 2.0 | 1.2 | 1.0 | −0.4 | −1.0 | 0.8 | 1.6 | 3.1 |

[1] The World Bank has been studying various methods for estimating East European GNP growth rates. See the paper in this volume by Paul Marer, "Alternative Estimates of the Dollar GNP and Growth Rates of the CMEA Countries."

Source: Thad Alton and Others, "Research Project on National Income in East Central Europe, Occasional Papers Numbers 70, 80, 85," L.W. International Financial Research, Inc. (New York, 1982, 1984, and 1985).

The slowdown in growth during the five years is even more pronounced when measured per capita, that is, taking into account growth of the population. This is an important measure because an economy with slow GNP growth, say 2 percent, whose population is expanding at a higher rate, say 2.2 percent, will experience a per capita decline and, therefore, a reduced standard of living unless the government gives large subsidies to the consumption sector.

GNP per capita growth was a robust 4.2 percent in 1970–75. In 1980–84, no country's GNP per capita growth averaged more than 1.4 percent and the average for the region was only 0.7 percent. In comparison, 1984 was a good year as growth reached 2.6 percent, about twice what it was in the next best year, 1983, of the five-year period. The 1984 regional growth rate was about twice as high as the average for 1975–80, but considerably below the rates for the two previous five-year periods. Table 2 shows GNP growth rates per capita.

Yugoslavia grew by about 2 percent in 1984, a slight rebound from the stagnation of the two previous years. The growth in GNP per capita was about 1.4 percent. In both 1982 and 1983, GNP per capita declined. Growth, in 1984, was led by a surge in industrial production of 5.5 percent and an increase in exports to hard-currency countries of nearly 9 percent. Agricultural production gained by a very modest 1.2 percent, but that should be compared with the 1983 decline of about the same percentage.

TABLE 2.—ANNUAL RATES OF GROWTH OF GNP PER CAPITA, 1970–84 [1]

[Constant prices, percent]

| Country | 1970–75 | 1970–80 | 1980–84 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|---|---|
| Bulgaria | 3.9 | 0.9 | 1.3 | 3.5 | −3.1 | 2.6 | 2.7 | −1.9 | 2.9 |
| Czechoslovakia | 2.7 | 1.5 | 0.9 | 0.3 | 1.2 | −0.6 | 1.5 | 0.7 | 2.0 |
| East Germany | 3.8 | 2.5 | 1.4 | 2.8 | 2.4 | 2.1 | −0.2 | 1.6 | 3.0 |
| Hungary | 3.0 | 1.9 | 1.2 | 0.4 | 0.4 | −0.1 | 3.7 | −1.1 | 1.5 |
| Poland | 5.7 | 0.0 | −0.3 | −2.3 | −4.1 | −6.2 | −1.8 | 3.7 | 2.5 |
| Romania | 5.2 | 2.9 | 1.3 | 2.9 | −2.4 | −0.2 | 2.1 | −0.1 | 4.0 |
| Totals | 4.2 | 1.4 | 0.7 | 0.5 | −0.9 | −1.5 | 0.5 | 1.2 | 2.6 |

[1] The World Bank has been studying various methods for estimating East European GNP growth rates. See the paper in this volume by Paul Marer, "Alternative Estimates of the Dollar GNP and Growth Rates of the CMEA Countries."

Source: Thad Alton and Others, *op. cit.*

It can be seen that 1984 diverges from previous years in several respects. Of course, it is too soon to tell whether it is the beginning of a new trend or a temporary upturn.

## FACTORS THAT CONTRIBUTED TO THE IMPROVEMENTS IN 1984

What accounts for the improvements? Several domestic and international factors have been identified:

*Continued growth of industrial production.*—Five of the six CMEA countries have had sustained growth in the gross output of industry, in the 3–4 percent range, over the past several years. Poland is the exception with declines in the early 1980's, but with growth averaging close to 6 percent in 1983 and 1984. Industrial output was particularly good in the region in 1984, rising above 5 percent in three countries (East Germany, Poland, and Romania), and reaching close to 4 percent or better in two countries (Bulgaria and Czechoslovakia), and a respectable 2.6 percent in Hungary. However, the record for gross investment in fixed capital was quite mixed. Growth of investment was moderate to high in three countries (Czechoslovakia, Poland, and Romania), but only 1 percent or less in the others (Bulgaria, East Germany, and Hungary).

*Recovery in agriculture.*—Agriculture has been a problem sector in most of the six countries for the past decade, and 1983 was an average year for three (Czechoslovakia, East Germany, and Poland) and a poor one for the others (Bulgaria, Hungary, and Romania). All had a good year in 1984, with record harvests for several. Hungary's growth of about 2 percent was the least impressive, but it reversed the decline of the year before.

There was a drought in the region in 1983. Favorable weather in 1984 accounts in large part for the good results in agriculture and the economy benefited from these developments in several ways. Greater food supplies improves worker morale and productivity. Agricultural production includes raw materials consumed by industry and increases in this area have positive effects on industrial production. The increases in food production also reduced the need for foreign imports and thereby permitted higher imports of raw materials and manufactured goods.

*Improvement in energy.*—Energy performance improved in the region as a whole, although not uniformly. There was an overall increase in production of domestic supplies especially coal, natural gas, and electricity. Poland's gains in coal production were high enough to enable her to become, once again, a net exporter. There was improvement in energy efficiency of most economies, that is, a reduction in energy consumption relative to net material production. The world energy situation was also helpful to Eastern Europe. World prices, and therefore the prices charged by the Soviet Union, were held down by the increase in non-OPEC oil production and the slow growth in oil demand.

*Favorable international developments.*—The relative decline in prices paid for energy imports reduced the need to export manufactured goods and conserved hard currencies. The increased agricultural production, as has been mentioned, had a similar result. Both developments contributed to a continued improvement in hard-currency balance-of-trade payments which reduced pressures to hold down imports. Most countries increased modestly their hard-currency exports and imports.

*Economic reforms.*—Several countries (Bulgaria, East Germany, Hungary, and Poland) are engaged in varying types of economic reforms initiated in 1983–84. For the most part, the reforms involve use of economic incentives to increase productivity. For example, in Bulgaria, privately farmed plots and individual and family contracts for certain types of farming have had good results. However, these initiatives as well as new forms of planning and efforts at energy conservation being tried in East Germany are in the experimental stage and do not seem to portend fundamental change. It is too soon and may not ever be possible to quantify the results for 1984.

## ISSUES FOR THE REST OF THE 1980's

The transition from rapid growth to slow growth and austerity in Eastern Europe poses serious dilemmas for all concerned. The principal issues are:

*Relations with the West.*—The CMEA countries need goods and services from the West. Such goods and services are essential for furthering economic modernization, which is critical to foreign trade competitiveness and improving consumer standards. The perceived need for expanding East-West trade is shared by many Western industrial countries. The West requires the East to service its debts, and many in the West see resumed economic growth throughout the East European region and an expansion of the CMEA market as in both their own economic interests.

There are also forces operating as constraints on East-West trade expansion. The need to service rather than acquire additional debt and urgent domestic claims on the kinds of resources the CMEA countries could export for hard currency are slowing the trend toward further interdependence.

In addition, East Europeans are aware that there are advantages and disadvantages to East-West ties. The opening to the West brought in new technology, and higher quality goods, exposing the CMEA economies to healthy market competition. But the oil shocks, inflation, and recession in the West during the 1970's reduced demand for imports from the East European countries, brought about a credit squeeze, and had adverse effects on the balance of payments.

The individual countries responded quite differently in making the necessary adjustments, with varying success. In general, however, the region went into recession.

*Socialist integration.*—Many within the CMEA urge a turn toward increased socialist integration. A move away from Western ties would avoid the economic uncertainties and the destabilizing effects associated with such Western economic problems as recession and inflation, as well as the political vulnerabilities associated with Western sanctions and embargoes. The proponents of CMEA autarchy are the counterparts of many in the West who argue for more restricted Western trade with the CMEA because of security and human rights concerns. The integrationists also point to the dependence of CMEA on Soviet energy supplies. Even though the Soviet terms of trade have been toughening—prices are rising toward the OPEC level and supplies are restricted at concessionary rates—the U.S.S.R. still retains a strong economic lever over political-economic policy in the CMEA Six. Soviet restrictions have, however, forced the CMEA to look more toward OPEC for Middle Eastern oil. But the East Europeans have limited hard currency or "hard goods" to trade. The result has been a restriction on hard-currency imports and domestic investment contributing to slow economic recovery and technological improvement. Likewise, the Soviet determined defense burden is growth retarding and probably unpopular in the CMEA-Six.

Others in CMEA argue for continued economic interchange with the West to promote competitiveness and improvement in Eastern economic performance. They point out that, because intra-CMEA prices are derived from market prices and because CMEA technological progress in the past has depended upon imports from the West, the option to insulate the CMEA from the world market is not really viable. Moreover, intra-CMEA requirements tend to be the residual claimants of limited resources. Each member of the CMEA tends to give priority to the demands of the Soviet, Western, and domestic markets rather than to the import requirements of their smaller CMEA colleagues.

*Relations with the Soviet Union.*—The Soviet Union and the CMEA-Six look to one another for important economic requirements: the CMEA countries look to the Soviet Union for more and cheaper energy resources as well as other raw materials; the Soviet Union looks to the CMEA-Six for more high quality machinery and consumer goods. Still, there is great concern among East Europeans about overdependency on Soviet energy and the ability of the Soviets to alter the terms of trade in their favor.

Many East Europeans argue for more diversity in their systems of planning and management to improve the efficiency of their economies, to reduce their reliance on Soviet energy imports, and to increase the quality of their exports to the West and the East. There is great resistance to reforms. Basic changes in planning and management mechanisms are considered uncertain, prone to failure in the existing low-growth environment, risky politically in terms of upsetting the dominant role of the Communist Party, and likely to lead the Soviet Union to reduce the benefits of bilateral trade. Nevertheless, reforms in Hungary and elsewhere have been demonstrably successful and the movement towards greater reform and decentralization will probably continue in much of the region, although at a slow pace.

## PROSPECTS

Problems and prospects for the CMEA economies in the decade of the 1980's are of pivotal concern for Western and Soviet decisionmakers. The economies whose GNP grew at a rate of 4.9 per annum in the first half of the 1970's (1971–75) and 2 percent during the second half (1976–80), slowed to virtually no growth in the early 1980's, with Poland's performance the singular most retarding factor. Yugoslavia, not a full CMEA member, suffered from similar growth retardation because of comparable economic malaise experienced during the same period. This downward trend in economic performance was compounded by poor agricultural performance resulting from an adverse weather cycle, and a global recession restricting foreign trade earnings. The long-term and short-term problems may lead to further economic decline—or to resumed growth with good luck, good policy choices, and favorable Soviet and Western policies toward the CMEA-Six and Yugoslavia. The improved performances in 1984 could be the start of a new trend.

The aging leaderships undoubtedly hope for favorable economic fortunes, such as good weather and stable energy prices in the future. But their choice of economic policies will obviously affect not only the day-to-day functioning of the economies, but longer term prospects as well. Some of the decisive factors that will influence the outcomes of the economic policies of the CMEA-Six and Yugoslavia in the rest of the 1980's include:

*Allocation.*—The structure and efficiency of investment, the incentives for and adequacy of consumption, and the management of the defense burden.

*Reform.*—The effectiveness of short-term and long-term changes in planning and management, and particularly the introduction and success of new economic incentives.

*Regional policy.*—The efficient distribution and utilization of labor, capital, and natural resources among the unevenly developed regions of Eastern Europe.

*CMEA.*—Improvement in economic performance through changes in the interrelationship of the Soviet economy with the economies of Eastern Europe, Vietnam, and Cuba, and offsetting of reduced Soviet subsidies.

*Western commerce.*—Growth of effective commercial interrelationships between the technologically advanced Western economies and the countries of Eastern Europe.

Predictions are hazardous at any time, but especially so in a time of economic travail, with a new Soviet leadership, an uncertain world energy market, and reliance on weather forecasts. The papers in this volume offer an analytical basis for evaluating the range of likely problems and prospects faced by the Eastern European economies in this decade.

Economic growth is a problem high on the agenda of the East European leaderships for the 1980's. Economic collapse—a series of negative growth periods with a loss of political control by the Party—seems beyond the ranges of reasonable probability in most Western, professional assessments. Crises—economic problems serious enough to trigger basic changes in priority allocations and systemic characteristics—are possible, although not generally predicted. Most foresee a general continuation of slow growth and no systemic changes. Slow growth of 2–3 percent annually for the second half of the 1980's would allow some increase in consumer standards.

This projection assumes a continuation of the favorable conditions that prevailed in 1984, and further improvements in the energy sector and in the ability of the East Europeans to import Western technology and manufactured goods. The consensus of the experts is that a resumption of the high growth rates of the early 1970's is highly unlikely, and that several countries could fall back into the crisis or near crisis of the early 1980's under certain circumstances, including: a return of bad weather and crop failures, a new round of world energy price increases, a let up in efforts to increase domestic energy production and in energy efficiency, and an inability to attract Western credits or to trade with the West. In addition, the countries of Eastern Europe are highly dependent on the Soviet Union for energy, and run high trade surpluses with the Soviets. If Moscow were to place new restrictions on energy exports to its allies or insist that the trade surpluses be substantially reduced, growth in Eastern Europe would be seriously constrained.

# I. ECONOMIC PERFORMANCE

## OVERVIEW: ASSESSING ECONOMIC PERFORMANCE

By Morris Bornstein*

The papers in this section analyze and evaluate various aspects of the economic performance of East European countries. These papers reach a number of important conclusions about the causes and extent of the internal and external problems of these economies, and their success in dealing with them.

Of the eight studies, three examine adjustment to changes in the world economy; two address measurement of economic size, structure, and growth; and three consider aspects of human capital, including population characteristics, use of the labor force, and personal welfare.

### ADJUSTMENT TO THE WORLD ECONOMY

The role of East European countries in the world economy, and their ability to adjust to changes in it, are discussed in the papers by Bond and Klein, by Vaňous, and by Balassa and Tyson.[1]

Bond and Klein trace major changes in the world economy after OPEC's increases in oil prices in 1973–74. In the industrialized market economies, the consequences were greater rates of inflation and unemployment, larger budget deficits, restrictive monetary policies, and higher interest rates. In turn, East European nations (and Third World developing countries) had to pay higher interest rates on their convertible currency debt but could not increase their convertible currency exports much. As a result, borrower countries found it difficult (in some cases impossible) to meet debt service obligations in the form of repayments of principal and interest payments on outstanding balances.

In the rest of the 1980s, the growth of world trade and of East-West trade is likely to be modest. The evolution of the East European countries' convertible currency merchandise trade, balances of payments, and debt depend on various related factors in the world economy. These factors include domestic growth rates in the industrialized market economies, world market prices for fuels and other commodities, interest rates in world capital markets, and the strength of the dollar compared to other world trading currencies.

Because of the uncertainties concerning these factors, Bond and Klein offer three alternative sets of projections through 1988 for the convertible currency earnings, payments, and debt of the six

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* Professor of Economics, The University of Michigan.

[1] In this essay, papers are cited by the name(s) of the author(s).

East European centrally planned economies (CPEs)—Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, and Romania—as a group and also of the Soviet Union. Their alternatives include an intermediate "baseline" scenario and more optimistic and more pessimistic versions. The various projections indicate that Eastern Europe's convertible currency trade and debt situation is likely to show only slight improvement in the next few years.

The study by Vaňous complements that of Bond and Klein in two important ways. First, Vaňous treats separately each of the six East European countries, showing significant differences among them. Second, he explains that the East European Six have serious external payments problems not only with the industrialized market economies but also with the Soviet Union, a major trading partner and chief supplier of imported fuels and raw materials to the East European countries.

Moreover, Eastern Europe's payments problems with the Soviet Union are linked to developments in the world market. Trade among CMEA member countries—including the Soviet Union and the East European Six, as well as Cuba, Mongolia, and Vietnam—takes places at "contract" prices that are supposed to be based on a moving five-year average of the world market price for the particular commodity. Thus, increases in world market prices are reflected, with an attenuating lag, in CMEA contract prices.

Following a nearly 50-percent increase in the world market dollar price of oil in 1979 and an additional 65-percent increase in 1980, the Soviet foreign-trade ruble price of oil to East European countries increased 30–45 percent in 1981 and an additional 19–27 percent in 1982—depending on the East European country—and about 20 percent on the average in 1983. For the East European Six as a group, the average prices of their imports from the Soviet Union rose faster than the average prices of their exports to the Soviet Union. As a result, the East European countries' terms of trade with the Soviet Union deteriorated by about 6 percent in 1981 and again in 1982, and by about 4 percent in 1983. Hence, to maintain the quantity of imports from the Soviet Union, the East European countries had to increase the quantity of exports to it.

Thus, the East European economies were forced to cut the domestic use ("absorption") of output in order simultaneously to curtail imports from the West and to expand exports to the Soviet Union. This painful adjustment process involved slower growth or absolute declines in new fixed investment and in consumption.

Vaňous concludes that, at least for the next few years, Eastern Europe is likely to remain on a "low-growth" plateau--with annual increases in net material product averaging perhaps 2 percent, compared with 3.6 percent in 1976–80 and 7.6 percent in 1971–75.

The third paper in this group, by Balassa and Tyson, examines government policy responses in Hungary and Yugoslavia to external shocks to their economies in 1974–76 and 1979–81.

Since Yugoslavia has a socialist regulated market economy, rather than a socialist centrally planned economy, it is excluded from discussions of the centrally planned economies of the East European Six. Yugoslavia's involvement and problems in the world economy over the last two decades are in many ways similar to those of developing countries in Latin America or Asia.

Because of an economic reform ("The New Economic Mechanism," or NEM) introduced in 1968, and reiterated in 1980, Hungary has a somewhat modified centrally planned economy with more flexible prices and exchange rates than the other countries of the East European Six. Through these and other features of the NEM, the Hungarian economy has become more integrated with—and thus more vulnerable to disturbances in—the world economy. Hungary is therefore the member of the East European Six most appropriate for a comparison with Yugoslavia.[2]

Balassa and Tyson compare Hungary and Yugoslavia in detail in two respects. First, they examine the nature and size of the effects on these countries' balances of payments from external shocks, including the consequences for the terms of trade, export volume, and interest rates on foreign borrowing. Second, they consider how the two countries responded to these developments by additional net external financing, import substitution, export promotion, restrictive domestic economic policies, and institutional reforms.

Balassa and Tyson find striking parallels between Hungary and Yugoslavia in 1974–76 in their reluctance to take macroeconomic adjustment measures and in their preference for external borrowing and for import substitution. In contrast, in 1979–81, when net foreign borrowing on the earlier scale was not possible, both countries were forced to adopt strong deflationary economic policies, especially in regard to investment, and to tighten import restrictions. However, the two countries differ in the role of marketizing economic reforms in the adjustment process. Hungary undertook new reform measures, but Yugoslavia, for internal political reasons, did not.

## ECONOMIC SIZE, STRUCTURE, AND GROWTH [3]

Official statistics of the East European countries and the Soviet Union do not provide an adequate picture of the size, structure, and growth of their economies, for a number of reasons (some of which are more applicable to one country than another). First, statistics are not published on many internal and external economic activities of interest. Second, the statistical concepts used may give an incomplete picture of the activity; for example, figures for national income in terms of net material product (NMP) exclude most services. Third, statistical methodologies—and changes in them—often are not fully explained. Fourth, administratively set non-scarcity prices are used to aggregate physical output series. Also, the uneven incidence of indirect taxes and of subsidies on different categories of goods and services distorts the relative shares of different end-uses of national product. Commonly, the share of consumption is higher, and the shares of investment and defense are lower, at the officially established prices than at factor cost excluding indirect taxes and subsidies.

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[2] The Hungarian and Yugoslav economic systems are discussed in depth in several papers in a succeeding volume of this collection.

[3] The paper "Industrial Policy in East Europe: A Comparison of Poland, Czechoslovakia, and Hungary," by Josef C. Brada and J. Michail Montias, referenced in the overview on the defense sector, is not specifically discussed in this overview.

Hence, Western specialists—notably Alton and his associates—have devoted much effort over a number of years to estimating various aspects of East European countries' national product according to the concepts of gross national product (GNP) and gross domestic product (GDP) recommended by the United Nations and used by most of its member countries.

Alton's paper in this volume presents estimates for selected years during 1965–81 or 1965–82 for each of the East European Six covering the composition of current GNP by sector of origin and by end use; the growth of real GNP and its components; the growth of employment and of labor productivity; and GNP expressed in constant 1981 dollars.

In regard to economic structure, the shares in total national product of industry and agriculture are higher, and that of services lower, in Eastern Europe than in Western Europe. However, the share of private consumption in total domestic use of national product (about 60 percent) is similar to that in Western countries.

The average annual percentage rate of growth of GNP in the East European Six as a group has fallen markedly, from 4.1 in 1970–75 to 3.1 in 1975–80 and −1 in 1981–82. Within these totals, industry continued to grow more rapidly than agriculture. Labor productivity, measured in terms of GNP per worker, has declined sharply since 1975.

The most difficult and least reliable of Alton's measures is the expression of East European GNPs in dollars. Exchange rates are imperfect convertors for the translation of GNP (and its components) in one currency into another currency. This is true even in the case of two market economies in which prices generally reflect relative scarcities and changes in exchange rates are expected to play a significant role in equilibrating the balance of payments. First, some goods and services are not traded internationally. Second, foreign exchange is acquired for capital movements and other purposes besides the purchase of (internationally traded) goods and services. Third, governments intervene in foreign exchange markets. The use of exchange rates to convert national product aggregates in other currencies into dollars is even less appropriate in the case of CPEs, in which administratively set prices do not correspond to relative scarcities, and arbitrary official exchange rates do not seek to measure the relative purchasing powers of currencies or to regulate the balance of payments.

Marer's paper addresses the problems involved in efforts to express in dollars the GNPs of the East European countries (and the Soviet Union and Cuba). The first, and relatively much easier, step is to estimate GNP, rather than the official concept of NMP, in the national currency. The second, and extremely difficult, step is to convert the GNP figures in national currencies into dollars. For reasons already explained, official exchange rates are not a truly suitable method. A theoretically superior method is, in essence, to calculate the relative purchasing powers of an East European currency and the dollar in terms of the number of units of each required in the respective country to buy the same basket of goods and services. A third method calculates a regression relationship between (a) relative performance on a set of physical indicators of economic development and (b) estimates, by the first or second method, of per capita dollar GNP for selected countries. The statistical relationship obtained is then used to estimate the per capita dollar GNPs of other countries for which the physical indicator data are available.

Marer explains and evaluates each of these methods, and combinations of them, and compares the results of numerous statistical tests of the different methods. This exhaustive study indicates that each proposed method has its shortcomings and that estimates of dollar values of the GNPs of East European economies may have a large margin of error.

## POPULATION, LABOR, AND WELFARE

Estimates of the size of the population and its distribution by age and sex, such as those provided in the paper by Baldwin, are necessary for a number of purposes. In comparisons of East European countries with each other and with other nations, it is often desirable to "normalize" figures for GNP, convertible currency debt, and other economic indicators through their presentation on a per capita basis, as in the studies of Alton and Marer. Also, these population estimates are necessary for assessments of the success of employment policies, like the paper by Adam. Finally, population estimates are essential in the measurement and evaluation of individual welfare, undertaken in the essay by Clayton.

The East European Six claim to achieve full employment, in contrast to often serious unemployment in capitalist market economies. This alleged superior performance by the former is ascribed to the combination of socialism's commitment to economic security ("the right to work") and central planning's assurance of high aggregate demand.

Adam's paper on employment policies in Poland, Czechoslovakia, and Hungary explains how, despite relative stagnation or decline in output in recent years (discussed by Vaňous and Alton), these countries avoided significant rates of unemployment. The number of jobs was maintained at, or above, the full employment level through the primacy of output (rather than cost or profit) as the key performance indicator; restrictions on dismissals; and changes in pension arrangements, maternity leave provisions, and the scope of the private sector.

However, these three (and other) East European countries have been less successful in regard to the other aim of employment policy—the efficient use of labor. Workers are often underutilized in their jobs. Enterprise managers hoard labor in response to (and thereby increase) labor shortages. Labor turnover is excessive. Labor discipline is weak. Efforts to overcome these problems—through such methods as lower labor quotas in enterprise plans, wage regulation, and taxes on wages—have proved inadequate. Adam concludes that much more fundamental measures would be necessary, including the introduction of scarcity prices and the curtailment of subsidies.

Individual perception of well-being depends not only upon consumption of goods and services, measured by Alton, and job security and work effort, analyzed by Adam. Clayton examines a number of additional social indicators, including the extent of inequality in the distribution of income and wealth, life expectancy, environmental quality, and human dignity, She finds that, compared to Western societies, East European countries are more egalitarian and offer greater job security, but are clearly inferior in regard to personal freedom.

## CONCLUSION

The precise measurement of the economic performance of the East European countries and comparisons with the performance of other economies are difficult both because of incomplete statistical data and because of a number of methodological problems. Yet the studies in this section clearly show that East European economic growth has been low in the early 1980s and is likely to continue so in the rest of the decade. An important cause is a set of related adverse developments in Eastern Europe's economic relations both with industrialized market economies and with the Soviet Union. However, in the face of slow growth—or sometimes stagnation or even declines in output—the East European countries remain committed to full employment policies and to limited inequality in income distribution.

# Section A. Adjustments to External Factors

## IMPACT OF CHANGES IN THE GLOBAL ENVIRONMENT ON THE SOVIET AND EAST EUROPEAN ECONOMIES

By Daniel Bond and Lawrence R. Klein*

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### I. IMPACT ON THE SOVIET AND EAST EUROPEAN ECONOMIES

Some of the economic implications for the Soviet Union and Eastern Europe of future changes in world conditions are illustrated by research undertaken at Wharton EFA on the outlook for the world financial situation.[1] Specifically, Wharton's projections of Soviet and East European hard currency trade, balance of payments and debt clearly show the significance of changes in factors external to the region—such as the rate of growth of the Western economies, world trade prices for fuels and for other commodities, interest rates, the strength of the dollar.

At the end of 1982, the net hard-currency debt of the six East European CMEA countries—Poland, East Germany, Czechoslovakia, Hungary, Romania and Bulgaria—was estimated by Wharton to have been almost $54 billion.[2] (Of this amount $25.5 billion was

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* Wharton Econometric Forecasting Associates and the University of Pennsylvania, respectively.

[1] See Wharton Econometric Forecasting Associates, "The World Economy at a Crossroads: International Financial Crunch, Crisis or Crash?" (1983 and subsequent updates on this report issued by Wharton).

[2] The data and estimates of Soviet and East European balance of payments and debt used in this paper for the period through end of 1982 are those reported in the Wharton Centrally

Continued

Polish and $9.1 Romanian.) The Soviet debt at this time was approximately $8 billion. Although in total this represents only about three-fourths of either the Brazilian or the Mexican debt alone, it has created considerable concern in world financial markets. The Polish figure is quite large, by itself, on a world scale. As a result of the necessity of rescheduling debt repayments first for Poland, and then for Romania, Western lenders became very hesitant to provide additional sums to these countries, and even to others in the region. As a result Hungary and East Germany have recently faced liquidity crises.

Adjustments made by most East European countries to reverse the deteriorating trends in their balance of payments have been both dramatic and successful, at least in the short run. In 1981 and 1982 there have been sharp reductions in imports from the West, while exports have been maintained at high levels, especially given the generally weak demand for imports in the West due to the economic recession there. The region's current account deficit dropped from −$8.0 billion in 1979 to −$3.6 in 1981 and showed a surplus of $1.7 billion in 1982. Today, none of the East European countries, with the exception of Poland, appears to be near insolvency.

This has been a costly adjustment for Eastern Europe, as domestic growth has had to be sacrificed. Initially, cutbacks were made in domestic consumption which allowed reductions in food and consumer imports. But further reductions in imports were required, and machinery and intermediate goods imports have now been reduced. This has resulted in lower levels of investment and underutilized capacities in some industries that are dependent on imports from the West. It is estimated that the region as a whole experienced a decline in GDP in both 1981 and 1982. And it is likely that the costs in foregone growth will continue to mount unless there are some increases in imports from the West, especially for machinery and intermediate goods. Thus, changes in the world economy affecting this situation are of great significance for the region.

Although the Soviet Union currently has a rather healthy financial picture, having reduced its net hard-currency debt by almost $3 billion in 1982 alone, it is expected to need, over the next few years, access to considerable amounts of Western machinery to realize its investment plans for the agricultural and energy sectors. Currently its ability to earn hard-currency for these purchases is threatened by lower than expected energy trade prices. The Soviet and East European situations are linked by the fact that most of their trade is with each other. In particular, the East European countries are dependent on the Soviet Union for much of their energy imports. Thus if the Soviet Union has to divert additional quantities of oil to Western markets to earn hard currency, this could have important implications for the other countries of the region.

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Planned Economies Service Balance of Payments and Debt Reports released during the first six months of 1983. In preparing these reports the Wharton staff draws upon the trade and financial statistics released by the governments of the countries covered, supplemented by data from Western sources. Commodity trade figures are given on an f.o.b. basis, except in the case of Hungary where imports are given on a c.i.f. basis.

To analyze the implications of projected changes in world economy, projections of Soviet and aggregate East European hard-currency accounts were prepared corresponding to three scenarios of world economic conditions. The models used for this exercise are designed to relate changes in Soviet and East European trade and financing to the following international variables: [3]

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[3] This model was designed to help in projecting nominal hard-currency (i.e., convertible currency) trade and external financial balances for the Soviet Union and the major East European countries. Its structure is based on the prototype developed by Dr. William R. Cline of the Institute for International Economics and described in his recent paper "Developing Country Debt under Alternative Global Conditions: 1983-86" (unpublished). Certain modifications in Cline's model specification, choice of variables and parameters were necessary, and are noted below.

The first step in the modeling process is to determine trade flows, which are disaggregated into two commodity groups—fuel and non-fuel. The nominal value of fuel exports and imports are calculated on the basis of previous year trade values times the change in average world price of traded fuels. (Where quantity changes are expected to occur, this is introduced exogenously.) The nominal value of non-fuel exports is linked to the rate of real GDP growth of the OECD countries, the change in average world price of non-fuel trade, and the value of the dollar relative to other major world currencies.

In his model, Cline assumes that above a threshold of OECD growth of 1 percent per year each extra percentage point of OECD growth would result in a 3 percent increase in LDC nonfuel exports. This was considered to be too optimistic for projecting the future growth of Soviet and East European hard-currency exports. Thus the threshold was raised to 2 percent and the elasticity was reduced to 1.5 for the projections presented here.

Non-fuel imports are linked to the rate of real GDP growth in the country being examined, and also the change in average world price of non-fuel trade and the value of the dollar. Both long term and short term import effects are captured in this formulation. As in Cline's analysis, a long term import elasticity of 1 and a short term elasticity of 3 were used.

The non-fuel trade projections include an adjustment for changes in the value of the dollar to reflect the fact that while the financial balances are recorded in current dollars, a large portion of this trade is conducted in other currencies. Thus "if the dollar depreciates from its currently high level, the effect will be a rise in the dollar value of LDC exports and a recuperation of the level of those exports relative to the largely dollar-denominated external debt." (Cline, p. 6)

In contrast to Cline's model, no term was included in the export equations to capture the response of export prices to short-term changes in OECD growth, since most of socialist nonfuel exports to the West consist of manufactured goods. Also, no term is included in the trade equations to reflect the impact of changes in a country's real exchange rate. This was necessitated by the lack of data on effective exchange rates or real trade prices for the socialist countries.

In order to calculate the hard-currency trade balance it is necessary to adjust the value of net exports to the West by subtracting the value of net Western trade conducted on barter terms and adding the value of net trade with other socialist countries conducted on a convertible currency basis. Both of these adjustments are set exogenously, in line with past trends.

Turning to the invisibles component of the current account balance, the value of net hard currency service trade, transport fees and transfers is tied to the value of the hard currency trade balance, using relationships estimated on the basis of past trends. Net interest payments are calculated on the basis of gross hard currency debt (medium and long term) held at the end of the previous year, with a reduction for the interest earned on hard-currency reserves held at the end of the previous year. Since a share of each country's debt is held at fixed exchange rates, interest on it is calculated at a fixed average rate. For the other portion of medium and long-term debt, the interest rate is set to fluctuate with the London Interbank Offer Rate (LIBOR) with a spread of 1.5%. The interest earned on reserves is set at 1.5% below LIBOR.

The capital account is specified as follows. First, external hard-currency reserves are assumed to change relative to the change in imports from the West. Gross debt at the end of each year is then calculated by subtracting the hard currency current account balance and adding the net change in reserves. Since only a portion of the debt held by the socialist countries is denominated in dollars, and the remainder is held in other currencies, an additional adjustment is made to reflect the impact on the nominal dollar value of the debt of changes in the strength of the dollar.

Repayments (or amortization of debt) are based on each country's amortization rate times debt at the end of the previous year. Gross annual financing requirements are equal to the net current account balance, change in reserves and repayments. Finally, net hard-currency debt is calculated by subtracting the value of reserves from gross debt.

The projections presented here simply portray the impact of alternative sets of assumptions for the exogenous variables on the results obtained from simulating the models. The only additional adjustments made were in the projections for Poland and Romania. To reflect the impact of rescheduling on their accounts, the rate of debt repayment has been reduced in both cases over the projection period. Also unpaid interest on the Polish debt has been carried forward as additions to the level of debt. (So as not to obscure the effect of changes in the global environment, these adjustments are the same in each of the three scenarios.)

Real GDP growth in the OECD countries;

The strength of the dollar relative to other major Western currencies;

International interest rates;

World non-fuel import prices;

World fuel import prices.

The impact of each country's own domestic economic growth are also incorporated in the modeling process.

Three scenarios have been examined—a baseline, an optimistic scenario, and a pessimistic scenario. The relevant quantitative assumptions pertaining to each are given in the accompanying tables. Their features can be summarized as follows:

The *baseline scenario* assumes a moderate recovery in the Western economies beginning in 1983, with GDP growth rates in the OECD countries averaging less than 3% over the forecast period 1983-88. There is a steady decline in the dollar over most of the period, a drop in interest rates in 1983-84 with only modest increases thereafter, gradually rising fuel trade prices following a drop in 1983-84, and fairly strong increases in non-fuel trade prices.

Domestic economic growth rates are projected to average 2.1% per year for Eastern Europe as a whole and 2.6% for the Soviet Union.

The *optimistic scenario* assumes a somewhat stronger recovery in the Western economies relative to the baseline, even lower interest rates, and more rapid increases in non-fuel prices. Other world variables correspond to the baseline assumptions. Domestic economic growth rates are assumed to be slightly higher than in the baseline.

The *pessimistic scenario* assumes a somewhat weaker recovery in the Western economies relative to the baseline, a stronger dollar over the period 1983-85, significantly higher interest rates, and lower fuel trade prices—especially over the next three years. Domestic economic growth rates are assumed to be lower than in the baseline.

The general nature of the interactions between world conditions and regional balance of payments are as follows:

Accelerated economic recovery in the Western economies will lead to an increase in the demand for non-fuel imports from the Soviet Union and Eastern Europe. It is assumed that for every 1% increase in real OECD GDP growth, total imports from this region will increase 1.5% in real terms.[4]

Since the Soviet Union and all East European countries, except Romania, are net exporters of energy for hard currency

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[4] The assumption of a 1.5% increase in real exports for each 1% increase in OECD growth rates is deliberately conservative, and recent short term results in several of these countries have been much better. However, the East European countries are likely to face problems in improving their export performance over the longer term. First, the recent rise in protectionist tendencies in the West bodes ill for them. Second, continued erosion in the competitiveness in Western markets of East European exports vis-a-vis exports of a number of the newly industrialized countries—particularly in light of recent sharp cutbacks in investment in Eastern Europe—will be a problem. Finally, continued deterioration of East European terms-of-trade with the Soviet Union will require that an increasing share of their higher quality goods will be diverted from Western markets if they are not to have growing trade deficits with the Soviet Union. Each of these considerations is dealt with in greater detail in other papers in this volume.

(that is the value of their exports—including re-exports in the case of some East European countries—sold for hard-currency exceeds the cost of energy imports paid for in hard-currency), their net export revenues are adversely affected by a decline in world prices for traded fuels.

Changes in world trade prices for primary materials and manufactured goods will proportionately affect both regional exports and imports of these commodities.

Lower interest rates will reduce the cost of debt servicing for all countries in this region, while higher rates will increase these costs. This will apply only to that portion of each country's debt which is not financed at fixed rates. The rates are assumed to move with the London Interbank Offer Rate (LIBOR), with a spread of 1.5%.

When the dollar depreciates relative to other major currencies, the effect will be to increase the nominal dollar value of most Soviet and East European exports and imports, and to increase the dollar value of that portion of their debt denominated in currencies other than the dollar.

It is also assumed that the level of real imports from the West and domestic economic growth in the Soviet Union and especially Eastern Europe are linked to some degree. Given the currently very depressed growth rates throughout the region, it is also assumed that as their current account situation improves, these countries will choose to increase hard-currency imports rather than to reduce their net debt faster than originally anticipated. Thus the rate of domestic economic growth assumed in the scenarios is adjusted to reflect either the need to reduce growth to hold back imports and free goods for export (in the "pessimistic" scenario) or the opportunity to increase growth as it becomes possible to finance additional imports (in the "optimistic" scenario).

The results of the projections are presented in the following tables.[5] (The East European account is an aggregation of the six individual country projections.) It should be kept in mind that this exercise is intended only to illustrate the impact of changing world conditions in the Soviet Union and Eastern Europe. The projections cannot be called forecasts, as no attempt has been made to reflect fully various responses that would likely occur in the regional economies, or feedbacks to the world economy. Certainly, given the results obtained in the pessimistic scenario, such response or feedbacks would be significant.

Looking first at the *baseline scenario,* it is clear that for the Soviet Union and Eastern Europe as an aggregate the outlook is for steady improvement from the troubling situation of the last few years. In the Soviet case there is a significant increase in net hard-currency debt, but this is balanced by adequate expansion in exports so that the ratio of debt service payments to the value of Western exports stays in the 4% to 6% range. Although debt servicing presents a much greater burden for Eastern Europe, it drops to 25% to 30% of exports for the period 1983–88, in contrast to the 38% to 48% range of the 1979–82 period.

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[5] In these tables "MDCs" stands for the developed market economies of the OECD and South Africa and "LDCs" stands for the noncommunist developing countries. The term Eastern Europe includes Poland, East Germany, Czechoslovakia, Hungary, Romania and Bulgaria.

With the exception of Poland, none of the East European countries appears to be near insolvency in this scenario. Even Romania, which has had to reschedule its debts, shows a marked improvement, with the debt service ratio dropping from a peak of 55% in 1982 to 27% by 1985 and after. Both Hungary and East Germany, countries that have had liquidity problems in the last two years, also show marked improvements, although Hungary's debt service burden remains the second highest after Poland's, fluctuating around 33% of exports for the entire forecast period.

In the *optimistic scenario* the major change is not in the financial situation, as debt service indicators are comparable to those of the baseline, but in the level of trade and growth. This is, of course, a direct result of the assumption that these countries would use any improvement in their external situation to increase imports and domestic growth, rather than reduce debt.

Most of the improvement shown in this projection comes from the positive impact of faster Western recovery on exports. By 1988 total exports to the West are 6–7% higher than they would have been otherwise.

The *pessimistic scenario* shows the combined impact of lower fuel prices, a strong dollar and higher interest rates. During the period 1983–1985, the sharply lower fuel trade prices cost the Soviet Union $5.4 billion. This helps to push Soviet net debt up from the 1988 baseline figure of $13.4 billion to $20.4 billion in this scenario. With a sharp increase in interest rates in 1985–88, debt servicing climbs to 6.5% of export earnings. While this situation does not appear particularly bad in comparison with the problems that many countries are facing today, it may be difficult for the Soviets to obtain Western financing for such an increase in debt. Since many other oil exporting countries would face financing problems if oil prices follow this path, funds would be particularly scarce.

The impact on Eastern Europe is even more adverse. Largely as a result of higher interest rates and a worsening non-socialist trade balance, total net debt is projected to increase from $53.7 billion at the end of 1982 to $90.5 billion by the end of 1988. This is highly improbable given the shaken state of world financial markets. Although this scenario already assumed lower domestic growth to hold back imports, even further restraint would be necessary.

In this scenario each individual country in Eastern Europe shows a trend of worsening financial indicators, especially after 1985. By 1988, the burden of debt service to export earnings rises to 79% for Poland, 19% for East Germany, 27% for Czechoslovakia, 43% for Hungary, 41% for Romania, and 22% for Bulgaria. Given that many other economies in the world would also be experiencing difficulties under these conditions, it is quite unlikely that sufficient funds would be available to allow all, or even most, of the East European countries to avoid rescheduling or default.

Although the probability of world economic conditions being as adverse over the next five years as portrayed in this scenario is low, this case cannot be seen as an extreme one. Conditions in 1983 were closer to this case than the optimistic case, as the dollar remains strong, interest rates high, and economic recovery outside the U.S. weak.

## II. EAST EUROPEAN DEBT PROSPECTS

In his analysis of country debt, William Cline focuses on the issue of whether or not those countries currently facing severe financial problems because of their level of external debt should be considered insolvent or illiquid. He points out that "If they are merely illiquid, additional lending is appropriate to tide them over short-term difficulties. If they are insolvent, it may be more appropriate to recognize their debt as bad debt and attempt to salvage at least some portion of the debt while accepting some loss on face value, analogously to domestic bankruptcy proceedings whereby creditors attempt to secure so many cents on the dollar." [6]

However, he recognizes that the distinction between the two states is not as clearcut for a country as for a firm. He proposes that one criterion for judging whether a country is insolvent or illiquid is ". . . to examine whether trends are toward improvement or deterioration."

This rough guide can be applied in examining the results of the projections presented here. Looking particularly at the figures for the individual East European economies presented in the following tables, it can be seen that in the baseline and optimistic scenarios, from 1982 to 1985, there is significant improvement in the key ratio of debt service payments to export earnings for all countries except Poland. (The trend for Poland is more encouraging when it is recognized that the deferral of some debt servicing in 1981 and 1982 results in artificially low debt servicing ratios for those years.) This trend is more apparent when one looks at the ratio of level of net debt to exports, where there is improvement in all cases, including Poland.[7]

Looking out to 1988, both ratios are higher for all countries but Poland. However, these 1988 figures reflect improved conditions which lead to more rapid domestic growth in Eastern Europe supported by increased external financing. Those countries showing the largest increases in ratio of debt and debt servicing to exports (East Germany, Czechoslovakia, Bulgaria) are those in the most favorable positions in 1985.

Thus on the basis of whether or not conditions show a trend toward improvement, the financial situation of the East European economies appears not to be one of insolvency—with the possible exception of Poland—if world conditions are similar to those assumed in the baseline or optimistic scenarios.

The results obtained with the pessimistic scenario are not as encouraging. Here too the projections for 1985 show some lowering of the debt service ratios and debt to export ratios for most cases. But by 1988 the debt service rates increase somewhat, and the debt to export ratios are considerably higher. More importantly, in contrast to the previous scenarios, this is not a reflection of improved economic conditions in the region. The combined impact of reduced exports (in real terms) and price and interest rate changes is to increase the trade and current account deficits at the same time that domestic growth and imports are reduced. Although in the pessimistic scenario the 1988 figures generally show improvement over the figures in 1982 (and earlier years), it is not clear that the real prospects for some countries are improving.

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[6] William R. Cline, "International Debt and the Stability of the World Economy," Institute for International Economics: MIT Press, 1983, p. 45.

[7] It should be noted that 1982 is not the most appropriate year to use as a basis for these comparions. In the period from 1979 to 1982 most of the East European countries have already gone through dramatic adjustments which are reflected in the 1982 figures. If comparisons are made between 1979 or 1980 and 1985, for instance, the relative improvements are even more pronounced in many cases.

The projected levels of gross annual financing in the scenarios should also be noted. In the baseline and optimistic cases these range from 4 to 14 billion dollars a year, while in the pessimistic scenario this figure shoots up to 23 billion dollars by 1988. This increase in the need for additional financing leads to another important issue that Cline raises in his study: "If the prospective external deficits are so large that there is no plausible way they can be financed taking into account the severely shocked state of international credit markets, then the diagnosis must be one of insolvency." [8] Thus, even though the debt service indicators show an improving trend, it is necessary to question whether the projected amounts of annual financing are realistic.

Two considerations are of paramount importance here. First, there is the question of the level of global financing that will be available from banks and governments over the next few years. Second is the question of the priority of the East European countries in terms of gaining access to these funds.

It is not obvious at this time what the answer will be to the first of these questions. Most analysts agree that there will continue to be severe problems for countries attempting to obtain new debt financing over the medium term. But the second question may be the more critical one for Eastern Europe. For several reasons it is likely that the developing countries will have priority over Eastern Europe in gaining access to funds that are available. The degree of direct economic involvement of firms based in the countries which are the source of these funds is much greater for the developing countries than for Eastern Europe. This will be an important consideration for commercial bank lending. Support from international organizations will be conditional on both membership and degree of need—again to the disadvantage of the East European countries. And there are likely to be political considerations which will influence the position governments take on financing. There are the traditional considerations of "spheres of influence" which tie the European, North American and Japanese governments more closely to the developing countries of Africa, Latin America and Asia than to Eastern Europe. In addition there are East-West issues—such as the Reagan administration's position that the Soviet Union should be forced to "bail-out" Eastern Europe—which cloud the picture.

Thus while the already dramatic improvement in the East European position over the last two years, and the likelihood of continued improvement, may be arguments in favor of additional financing being provided to Eastern Europe, it is not clear at this time whether the future global economic and political environment will be conducive to this.

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[8] Cline, op. cit., p. 46.

## III. CONCLUSION

These projections illustrate how significantly changes in the global environment can impact on the Soviet and East European economies. If, over the medium term, there is a recovery in the West of at least modest proportions, then it appears that further financial crises in Eastern Europe are unlikely—assuming that a satisfactory rescheduling of the Polish debt can be achieved. However, without recovery in the West that would bring with it an increase in markets for East European products, the level of new financing that would be needed to allow necessary imports would probably not be available.

In conclusion it is necessary to stress that these projections do not incorporate within them any number of responses that can, and likely will, originate from within the countries of Eastern Europe, with results that could differ greatly from those projected here.

TABLE 1.—ASSUMPTIONS CONCERNING GLOBAL ECONOMIC CONDITIONS

| | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| BASELINE SCENARIO | | | | | | |
| OECD real GDP (1982=100) | 97.6 | 98.8 | 100.3 | 100.0 | 108.7 | 117.1 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 1.3 | 1.5 | −.3 | 2.8 | 2.5 |
| Dollar exchange rate index (1982=100) | 79.5 | 79.8 | 89.5 | 100.0 | 85.4 | 88.5 |
| Interest rate—libor (percent per year) | 12.1 | 14.2 | 16.8 | 13.2 | 9.2 | 8.7 |
| World fuel import price (1982=100) | 55.6 | 92.0 | 102.4 | 100.0 | 88.8 | 111.6 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 65.4 | 11.3 | −2.3 | −3.9 | 7.9 |
| World nonfuel import price (1982=100) | 102.6 | 110.5 | 105.1 | 100.0 | 129.5 | 144.4 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 7.7 | −4.9 | −4.8 | 9.0 | 3.7 |
| OPTIMISTIC SCENARIO | | | | | | |
| OECD real GDP (1982=100) | 97.6 | 98.8 | 100.3 | 100.0 | 110.4 | 121.4 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 1.3 | 1.5 | −.3 | 3.4 | 3.2 |
| Dollar exchange rate index (1982=100) | 79.5 | 79.8 | 89.5 | 100.0 | 85.4 | 88.5 |
| Interest rate—libor (percent per year) | 12.1 | 14.2 | 16.8 | 13.2 | 8.5 | 8.1 |
| World fuel import price (1982=100) | 55.6 | 92.0 | 102.4 | 100.0 | 88.7 | 111.7 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 65.4 | 11.3 | −2.3 | −3.9 | 8.0 |
| World nonfuel import price (1982=100) | 102.6 | 110.5 | 105.1 | 100.0 | 131.8 | 148.7 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 7.7 | −4.9 | −4.8 | 9.6 | 4.1 |
| PESSIMISTIC SCENARIO | | | | | | |
| OECD real GDP (1982=100) | 97.6 | 98.8 | 100.3 | 100.0 | 105.9 | 111.6 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 1.3 | 1.5 | −.3 | 1.9 | 1.8 |
| Dollar exchange rate index (1982=100) | 79.5 | 79.8 | 89.5 | 100.0 | 89.3 | 83.1 |
| Interest rate—libor (percent per year) | 12.1 | 14.2 | 16.8 | 13.2 | 11.1 | 12.4 |
| World fuel import price (1982=100) | 55.6 | 92.0 | 102.4 | 100.0 | 84.4 | 103.4 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 65.4 | 11.3 | −2.3 | −5.5 | 7.0 |
| World nonfuel import price (1982=100) | 102.6 | 110.5 | 105.1 | 100.0 | 126.8 | 153.2 |
| Percent growth (average annual 1983–85 and 1986–88) | 3.4 | 7.7 | −4.9 | −4.8 | 8.2 | 6.5 |

## TABLE 2.—SOVIET UNION—BASELINE SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Non-Socialist trade: | | | | | | |
| Total exports | 28.7 | 35.1 | 36.1 | 39.6 | 50.9 | 60.7 |
| Fuel exports | 14.3 | 19.4 | 19.2 | 22.8 | 23.3 | 29.3 |
| Nonfuel exports | 14.4 | 15.6 | 16.9 | 16.9 | 27.7 | 31.4 |
| Total imports | 25.1 | 32.1 | 36.0 | 35.1 | 53.1 | 58.8 |
| Fuel imports | 1.5 | 1.4 | 2.1 | 2.7 | 2.8 | 3.6 |
| Nonfuel imports | 23.6 | 30.6 | 33.9 | 32.4 | 50.3 | 55.3 |
| Non-Socialist trade balance | 3.6 | 3.0 | .1 | 4.7 | −2.1 | 1.9 |
| Net non-Socialist barter trade | 2.5 | 2.5 | 2.5 | 2.0 | 2.5 | 3.0 |
| Net Socialist hard-currency trade | −1.0 | −1.0 | −1.5 | −1.5 | −1.5 | −1.5 |
| Hard currency trade balance | .1 | −.5 | −3.9 | 1.2 | −6.1 | −2.6 |
| Net services and transfers | 1.3 | 1.1 | 1.2 | 1.3 | 1.6 | 1.8 |
| Net interest payments | −.8 | −.9 | −1.2 | −1.0 | −1.1 | −1.4 |
| Balance on current account* | 2.1 | .5 | −1.2 | 2.7 | −2.1 | 1.3 |
| Net external debt (end year) | 9.5 | 8.7 | 10.8 | 8.0 | 15.2 | 13.4 |
| Repayments | 1.8 | 1.5 | 1.3 | 1.7 | 1.6 | 1.9 |
| External reserves (end year) | 6.0 | 8.0 | 7.5 | 8.0 | 11.6 | 12.8 |
| Gross external debt (end year) | 15.5 | 16.7 | 18.3 | 16.0 | 26.8 | 26.2 |
| Gross annual financing | 1.9 | 3.0 | 2.0 | −.5 | 4.8 | 1.0 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 33 | 25 | 30 | 20 | 30 | 22 |
| Debt service/exports | 9 | 7 | 7 | 7 | 5 | 6 |
| Current account balance/exports | 7 | 1 | −3 | 7 | −4 | 2 |
| Reserves/imports | 24 | 25 | 21 | 23 | 22 | 22 |
| Domestic variables: | | | | | | |
| GDP (Western estimates, billions 1980 $US) | 1,373 | 1,393 | 1,418 | 1,440 | 1,554 | 1,680 |
| Percent change (average annual, 1983–85 and 1986–88) | .8 | 1.4 | 1.8 | 1.6 | 2.6 | 2.6 |
| * Including gold sales of | 1.5 | .8 | 2.8 | 1.2 | 3.5 | 3.5 |

## TABLE 3.—SOVIET UNION—OPTIMISTIC SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Nonsocialist trade: | | | | | | |
| Total exports | 28.7 | 35.1 | 36.1 | 39.8 | 52.3 | 64.0 |
| Fuels exports | 14.3 | 19.4 | 19.2 | 22.8 | 23.3 | 29.3 |
| Nonfuel exports | 14.4 | 15.6 | 16.9 | 16.9 | 29.0 | 34.7 |
| Total imports | 25.1 | 32.1 | 36.0 | 35.1 | 54.7 | 61.4 |
| Fuel imports | 1.5 | 1.4 | 2.1 | 2.7 | 2.8 | 3.6 |
| Nonfuel imports | 23.6 | 30.6 | 33.9 | 32.4 | 51.8 | 57.9 |
| Nonsocialist trade balance | 3.6 | 3.0 | .1 | 4.7 | −2.4 | 2.5 |
| Net Non-Socialist barter trade | 2.5 | 2.5 | 2.5 | 2.0 | 2.5 | 3.0 |
| Net Socialist hard-currency trade | −1.0 | −1.0 | −1.5 | −1.5 | −1.5 | −1.5 |
| Hard currency trade balance | .1 | −.5 | −3.9 | 1.2 | −6.4 | −2.0 |
| Net services and transfers | 1.3 | 1.1 | 1.2 | 1.3 | 1.6 | 1.8 |
| Net interest payments | −.8 | −.9 | −1.2 | −1.0 | −1.2 | −1.5 |
| Balance on current account * | 2.1 | .5 | −1.2 | 2.7 | −2.4 | 1.9 |
| Net external debt (end year) | 9.5 | 8.7 | 10.8 | 8.0 | 15.6 | 12.8 |
| Repayments | 1.8 | 1.5 | 1.3 | 1.7 | 1.6 | 2.0 |
| External Reserves (end year) | 6.0 | 8.0 | 7.5 | 8.0 | 11.9 | 13.3 |
| Gross external debt (end year) | 15.5 | 16.7 | 18.3 | 16.0 | 27.5 | 26.1 |
| Gross annual financing | 1.9 | 3.0 | 2.0 | −.5 | 5.2 | .5 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 33 | 25 | 30 | 20 | 30 | 20 |

## TABLE 3.—SOVIET UNION—OPTIMISTIC SCENARIO—Continued

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Debt service/exports | 9 | 7 | 7 | 7 | 5 | 5 |
| Current account balance/exports | 7 | 1 | −3 | 7 | −5 | 3 |
| Reserves/imports | 24 | 25 | 21 | 23 | 22 | 22 |
| Domestic variables: | | | | | | |
| GDP (Western estimate, billions 1980 $US) | 1,373 | 1,393 | 1,418 | 1,440 | 1,562 | 1,699 |
| Percent change (average annual, 1983–85 and 1986–88) | .8 | 1.4 | 1.8 | 1.6 | 2.7 | 2.9 |
| * Including gold sales of | 1.5 | .8 | 2.8 | 1.2 | 3.5 | 3.5 |

## TABLE 4.—SOVIET UNION—PESSIMISTIC SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Non-Socialist trade: | | | | | | |
| Total exports | 28.7 | 35.1 | 36.1 | 39.8 | 46.7 | 59.4 |
| Fuel exports | 14.3 | 19.4 | 19.2 | 22.8 | 22.1 | 27.1 |
| Nonfuel exports | 14.4 | 15.6 | 16.9 | 16.9 | 24.6 | 32.3 |
| Total imports | 25.1 | 32.1 | 36.0 | 35.1 | 48.8 | 60.2 |
| Fuel imports | 1.5 | 1.4 | 2.1 | 2.7 | 2.7 | 3.3 |
| Nonfuel imports | 23.6 | 30.6 | 33.9 | 32.4 | 46.1 | 56.9 |
| Nonsocialist trade balance | 3.6 | 3.0 | .1 | 4.7 | −2.1 | −.8 |
| Net non-socialist barter trade | 2.5 | 2.5 | 2.5 | 2.0 | 2.5 | 3.0 |
| Net socialist hard-currency trade | −1.0 | −1.0 | −1.5 | −1.5 | −1.5 | −1.5 |
| Hard currency trade balance | .1 | −.5 | −3.9 | 1.2 | −6.1 | −5.3 |
| Net services and transfers | 1.3 | 1.1 | 1.2 | 1.3 | 1.6 | 1.8 |
| Net interest payments | −.8 | −.9 | −1.2 | −1.0 | −.7 | −1.6 |
| Balance on current account * | 2.1 | .5 | −1.2 | 2.7 | −1.7 | −1.6 |
| Net external debt (end year) | 9.5 | 8.7 | 10.8 | 8.0 | 12.6 | 20.4 |
| Repayments | 1.8 | 1.5 | 1.3 | 1.7 | 1.3 | 2.2 |
| External reserves (end year) | 6.0 | 8.0 | 7.5 | 8.0 | 10.8 | 13.0 |
| Gross external debt (end year) | 15.5 | 16.7 | 18.3 | 16.0 | 23.4 | 33.4 |
| Gross annual financing | 1.9 | 3.0 | 2.0 | −.5 | 4.8 | 4.1 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 33 | 25 | 30 | 20 | 27 | 34 |
| Debt service exports | 9 | 7 | 7 | 7 | 4 | 7 |
| Current account balance/exports | 7 | 1 | −3 | 7 | −4 | −3 |
| Reserves/imports | 24 | 25 | 21 | 23 | 22 | 22 |
| Domestic variables: | | | | | | |
| GDP (Western estimate, billions 1980 $US) | 1,373 | 1,393 | 1,418 | 1,440 | 1,548 | 1,666 |
| Percent change (average annual, 1983–85 and 1986–88) | .8 | 1.4 | 1.8 | 1.6 | 2.4 | 2.5 |
| * Including gold sales of | 1.5 | .8 | 2.8 | 1.2 | 3.5 | 3.5 |

## TABLE 5.—EASTERN EUROPE—BASELINE SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Non-Socialist trade: | | | | | | |
| Total exports | 25.1 | 30.6 | 30.6 | 30.3 | 43.9 | 48.8 |
| Fuel exports | 5.1 | 6.4 | 5.8 | 5.5 | 5.0 | 6.2 |
| Non-fuel exports | 20.0 | 24.2 | 24.9 | 24.8 | 38.9 | 42.6 |
| Total imports | 30.1 | 34.5 | 30.6 | 25.2 | 41.3 | 49.8 |

## TABLE 5.—EASTERN EUROPE—BASELINE SCENARIO—Continued

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Fuel imports | 3.8 | 6.2 | 5.1 | 4.7 | 4.2 | 5.3 |
| Non-fuel imports | 26.3 | 28.3 | 25.5 | 20.5 | 37.1 | 44.5 |
| Non-Socialist trade balance | −5.0 | −3.9 | .0 | 5.0 | 2.6 | −1.0 |
| Net non-Socialist barter trade | .1 | .1 | .0 | 1.0 | .2 | .1 |
| Net Socialist hard-currency trade | .0 | 1.0 | .7 | 1.0 | .4 | .9 |
| Hard currency trade balance | −5.1 | −3.0 | .7 | 5.0 | 2.7 | −.2 |
| Net services and transfers | 1.0 | 1.5 | 2.1 | 2.0 | 2.2 | 2.0 |
| Net interest payments | −3.9 | −5.3 | −6.4 | −5.3 | −4.6 | −5.2 |
| Balance on current account | −8.0 | −6.8 | −3.6 | 1.7 | .3 | −3.4 |
| Net external debt (end year) | 50.3 | 56.6 | 57.3 | 53.7 | 57.7 | 66.5 |
| Repayments | 7.7 | 9.4 | 6.7 | 6.3 | 6.6 | 9.1 |
| External reserves (end year) | 7.8 | 8.4 | 8.4 | 7.4 | 10.7 | 12.4 |
| Gross external debt (end year) | 58.1 | 65.0 | 65.7 | 61.1 | 68.4 | 78.8 |
| Gross annual financing | 16.5 | 16.9 | 11.2 | 4.4 | 8.6 | 14.0 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 201 | 185 | 187 | 177 | 132 | 136 |
| Debt service/exports | 46 | 48 | 43 | 38 | 26 | 29 |
| Current account balance/exports | −32 | −22 | −12 | 6 | 1 | −7 |
| Reserves/imports | 26 | 24 | 28 | 30 | 26 | 25 |
| Domestic variables: | | | | | | |
| GDP (Western estimate, billions 1980 $US) | 628 | 627 | 622 | 622 | 660 | 705 |
| Percent change (average annual, 1983-85 and 1986-88) | 1.0 | −.2 | −.8 | .0 | 2.0 | 2.3 |

## TABLE 6.—EASTERN EUROPE—OPTIMISTIC SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Non-Socialist trade: | | | | | | |
| Total exports | 25.1 | 30.6 | 30.6 | 30.3 | 45.5 | 52.5 |
| Fuel exports | 5.1 | 6.4 | 5.8 | 5.5 | 5.0 | 6.2 |
| Nonfuel exports | 20.0 | 24.2 | 24.9 | 24.8 | 40.4 | 46.2 |
| Total imports | 30.1 | 34.5 | 30.6 | 25.2 | 42.9 | 52.7 |
| Fuel imports | 3.8 | 6.2 | 5.1 | 4.7 | 4.2 | 5.3 |
| Nonfuel imports | 26.3 | 28.3 | 25.5 | 20.5 | 38.7 | 47.4 |
| Non-Socialist trade balance | −5.0 | −3.9 | .0 | 5.0 | 2.6 | −.2 |
| Net Non-Socialist barter trade | .1 | .1 | .0 | 1.0 | .2 | .1 |
| Net Socialist hard-currency trade | .0 | 1.0 | .7 | 1.0 | .4 | .9 |
| Hard currency trade balance | −5.1 | −3.0 | .7 | 5.0 | 2.7 | .6 |
| Net services and transfers | 1.0 | 1.5 | 2.1 | 2.0 | 2.2 | 2.1 |
| Net interest payments | −3.9 | −5.3 | −6.4 | −5.3 | −4.4 | −4.8 |
| Balance on current account | −8.0 | −6.8 | −3.6 | 1.7 | .5 | −2.1 |
| Net external debt (end year) | 50.3 | 56.6 | 57.3 | 53.7 | 57.6 | 63.5 |
| Repayments | 7.7 | 9.4 | 6.7 | 6.3 | 6.6 | 9.0 |
| External reserves (end year) | 7.8 | 8.4 | 8.4 | 7.4 | 11.0 | 12.9 |
| Gross external debt (end year) | 58.1 | 65.0 | 65.7 | 61.1 | 68.6 | 76.5 |
| Gross annual financing | 16.5 | 16.9 | 11.2 | 4.4 | 8.5 | 12.7 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 201 | 185 | 187 | 177 | 127 | 121 |
| Debt service/exports | 46 | 48 | 43 | 38 | 24 | 26 |
| Current account balance/exports | −32 | −22 | −12 | 6 | 1 | −4 |
| Reserves/imports | 26 | 24 | 28 | 30 | 26 | 25 |

## TABLE 6.—EASTERN EUROPE—OPTIMISTIC SCENARIO—Continued

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections 1985 | Projections 1988 |
|---|---|---|---|---|---|---|
| Domestic variables: | | | | | | |
| GDP (Western estimate, billions 1980 $US) | 628 | 627 | 622 | 622 | 669 | 724 |
| Percent change (average annual, 1983-85 and 1986-88) | 1.0 | –.2 | –.8 | .0 | 2.5 | 2.5 |

## TABLE 7.—EASTERN EUROPE—PESSIMISTIC SCENARIO

[In billions of current dollars]

| Balance of payments | 1979 | 1980 | 1981 | 1982 | Projections 1985 | Projections 1988 |
|---|---|---|---|---|---|---|
| Non-Socialist trade: | | | | | | |
| Total exports | 25.1 | 30.6 | 30.6 | 30.3 | 39.8 | 50.6 |
| Fuel exports | 5.1 | 6.4 | 5.8 | 5.5 | 4.8 | 5.8 |
| Nonfuel exports | 20.0 | 24.2 | 24.9 | 24.8 | 35.0 | 44.8 |
| Total imports | 30.1 | 34.5 | 30.6 | 25.2 | 38.7 | 54.9 |
| Fuel imports | 3.8 | 6.2 | 5.1 | 4.7 | 4.0 | 4.9 |
| Nonfuel imports | 26.3 | 28.3 | 25.5 | 20.5 | 34.8 | 50.1 |
| Non-Socialist trade balance | –5.0 | –3.9 | .0 | 5.0 | 1.0 | –4.4 |
| Net Non-Socialist barter trade | .1 | .1 | .0 | 1.0 | .2 | .0 |
| Net Socialist hard-currency trade | .0 | 1.0 | .7 | 1.0 | .4 | .9 |
| Hard currency trade balance | –5.1 | –3.0 | .7 | 5.0 | 1.2 | –3.5 |
| Net services and transfers | 1.0 | 1.5 | 2.1 | 2.0 | 2.1 | 1.6 |
| Net interest payments | –3.9 | –5.3 | –6.4 | –5.3 | –5.1 | –8.6 |
| Balance on current account | –8.0 | –6.8 | –3.6 | 1.7 | –1.8 | –10.5 |
| Net external debt (end year) | 50.3 | 56.6 | 57.3 | 53.7 | 60.1 | 90.5 |
| Repayments | 7.7 | 9.4 | 6.7 | 6.3 | 6.4 | 10.9 |
| External reserves (end year) | 7.8 | 8.4 | 8.4 | 7.4 | 10.1 | 13.4 |
| Gross external debt (end year) | 58.1 | 65.0 | 65.7 | 61.1 | 70.2 | 103.9 |
| Gross annual financing | 16.5 | 16.9 | 11.2 | 4.4 | 11.1 | 23.1 |
| Key ratios (percent): | | | | | | |
| Net debt/exports | 201 | 185 | 187 | 177 | 151 | 179 |
| Debt service/exports | 46 | 48 | 43 | 38 | 29 | 39 |
| Current account balance/exports | –32 | –22 | –12 | 6 | –5 | –21 |
| Reserves/imports | 26 | 24 | 28 | 30 | 26 | 24 |
| Domestic variables: | | | | | | |
| GDP (Western estimate, billions 1980 $US) | 628 | 627 | 622 | 622 | 656 | 698 |
| Percent change (average annual, 1983-85 and 1986-88) | 1.0 | –.2 | –.8 | .0 | 1.8 | 2.1 |

## TABLE 8.—INDICATORS FOR INDIVIDUAL EAST EUROPEAN COUNTRIES—BASELINE SCENARIO

| | 1979 | 1980 | 1981 | 1982 | Projections 1985 | Projections 1988 |
|---|---|---|---|---|---|---|
| Current account (billions of dollars): | | | | | | |
| Poland | –3.4 | –2.6 | –2.1 | –1.0 | .5 | .6 |
| East Germany | –1.6 | –1.7 | –.1 | 1.7 | .2 | –1.7 |
| Czechoslovakia | –.5 | –.3 | –.1 | .2 | –.3 | –.7 |
| Hungary | –.8 | –.4 | –.7 | –.1 | .0 | –.1 |
| Romania | –1.9 | –2.4 | –.8 | .7 | .0 | –.7 |
| Bulgaria | .2 | .5 | .2 | .3 | –.2 | –.8 |
| Total debt (billions of dollars): | | | | | | |
| Poland | 22.3 | 25.0 | 26.4 | 26.6 | 32.7 | 33.5 |
| East Germany | 11.9 | 13.4 | 13.2 | 11.0 | 10.3 | 13.9 |
| Czechoslovakia | 4.4 | 4.7 | 4.5 | 3.8 | 4.9 | 6.7 |
| Hungary | 8.3 | 9.1 | 8.7 | 7.8 | 7.9 | 8.8 |

## TABLE 8.—INDICATORS FOR INDIVIDUAL EAST EUROPEAN COUNTRIES—BASELINE SCENARIO—Continued

| | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Romania | 7.4 | 9.6 | 10.0 | 9.4 | 9.3 | 10.9 |
| Bulgaria | 3.9 | 3.3 | 3.0 | 2.5 | 3.2 | 5.1 |
| Debt service/exports (percent): | | | | | | |
| Poland | 94 | 106 | 85 | 49 | 53 | 65 |
| East Germany | 38 | 39 | 37 | 29 | 13 | 14 |
| Czechoslovakia | 24 | 23 | 26 | 24 | 16 | 20 |
| Hungary | 29 | 28 | 49 | 50 | 33 | 34 |
| Romania | 27 | 27 | 33 | 55 | 27 | 27 |
| Bulgaria | 37 | 28 | 22 | 18 | 11 | 16 |
| Net debt/exports (percent): | | | | | | |
| Poland | 332 | 325 | 469 | 491 | 403 | 363 |
| East Germany | 248 | 212 | 164 | 116 | 63 | 80 |
| Czechoslovakia | 91 | 76 | 79 | 71 | 60 | 78 |
| Hungary | 166 | 145 | 147 | 135 | 87 | 89 |
| Romania | 132 | 147 | 136 | 151 | 100 | 103 |
| Bulgaria | 139 | 82 | 65 | 57 | 50 | 83 |
| Gross annual financing (billions of dollars): | | | | | | |
| Poland | 9.1 | 7.7 | 5.6 | 2.9 | 2.6 | 4.0 |
| East Germany | 3.0 | 3.0 | 1.4 | −.7 | 1.2 | 3.2 |
| Czechoslovakia | 1.2 | 1.1 | .5 | .2 | 1.0 | 1.6 |
| Hungary | 2.4 | 1.8 | 1.4 | .3 | 1.5 | 1.7 |
| Romania | 3.5 | 3.3 | 2.1 | 1.7 | 1.7 | 2.4 |
| Bulgaria | .8 | .0 | .2 | −.1 | .6 | 1.2 |

## TABLE 9.—INDICATORS FOR INDIVIDUAL EAST EUROPEAN COUNTRIES—OPTIMISTIC SCENARIO

| | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Current account (billions of dollars): | | | | | | |
| Poland | −3.4 | −2.6 | −2.1 | −1.0 | .7 | 1.0 |
| East Germany | −1.6 | −1.7 | −.1 | 1.7 | .2 | −1.5 |
| Czechoslovakia | −.5 | −.3 | −.1 | .2 | −.3 | −.6 |
| Hungary | −.8 | −.4 | −.7 | −.1 | .0 | .0 |
| Romania | −1.9 | −2.4 | −.8 | .7 | .2 | −.2 |
| Bulgaria | .2 | .5 | .2 | .3 | −.3 | −.8 |
| Total debt (billions of dollars): | | | | | | |
| Poland | 22.3 | 25.0 | 26.4 | 26.6 | 32.6 | 32.4 |
| East Germany | 11.9 | 13.4 | 13.2 | 11.0 | 10.5 | 13.7 |
| Czechoslovakia | 4.4 | 4.7 | 4.5 | 3.8 | 5.1 | 6.8 |
| Hungary | 8.3 | 9.1 | 8.7 | 7.8 | 8.1 | 8.8 |
| Romania | 7.4 | 9.6 | 10.0 | 9.4 | 9.0 | 9.6 |
| Bulgaria | 3.9 | 3.3 | 3.0 | 2.5 | 3.3 | 5.1 |
| Debt service/exports (percent): | | | | | | |
| Poland | 94 | 106 | 85 | 49 | 50 | 59 |
| East Germany | 38 | 39 | 37 | 29 | 12 | 13 |
| Czechoslovakia | 24 | 23 | 26 | 24 | 15 | 18 |
| Hungary | 29 | 28 | 49 | 50 | 32 | 32 |
| Romania | 27 | 27 | 33 | 55 | 25 | 23 |
| Bulgaria | 37 | 28 | 22 | 18 | 10 | 15 |
| Net debt/exports (percent): | | | | | | |
| Poland | 332 | 325 | 469 | 491 | 387 | 327 |
| East Germany | 248 | 212 | 164 | 116 | 61 | 71 |
| Czechoslovakia | 91 | 76 | 79 | 71 | 59 | 72 |
| Hungary | 166 | 145 | 147 | 135 | 86 | 82 |
| Romania | 132 | 147 | 136 | 151 | 93 | 82 |
| Bulgaria | 139 | 82 | 65 | 57 | 50 | 77 |

## TABLE 9.—INDICATORS FOR INDIVIDUAL EAST EUROPEAN COUNTRIES—OPTIMISTIC SCENARIO—Continued

| | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Gross annual financing (billions of dollars): | | | | | | |
| Poland | 9.1 | 7.7 | 5.6 | 2.9 | 2.4 | 3.6 |
| East Germany | 3.0 | 3.0 | 1.4 | –.7 | 1.3 | 3.0 |
| Czechoslovakia | 1.2 | 1.1 | .5 | .2 | 1.1 | 1.5 |
| Hungary | 2.4 | 1.8 | 1.4 | .3 | 1.5 | 1.6 |
| Romania | 3.5 | 3.3 | 2.1 | 1.7 | 1.5 | 1.8 |
| Bulgaria | .8 | .0 | .2 | –.1 | .7 | 1.2 |

## TABLE 10.—INDICATORS FOR INDIVIDUAL EAST EUROPEAN COUNTRIES—PESSIMISTIC SCENARIO

| | 1979 | 1980 | 1981 | 1982 | Projections | |
|---|---|---|---|---|---|---|
| | | | | | 1985 | 1988 |
| Current account (billions of dollars): | | | | | | |
| Poland | –3.4 | –2.6 | –2.1 | –1.0 | .1 | –1.1 |
| East Germany | –1.6 | –1.7 | –.1 | +1.7 | –.4 | –3.5 |
| Czechoslovakia | –.5 | –.3 | –.1 | .2 | –.4 | –1.5 |
| Hungary | –.8 | –.4 | –.7 | –.1 | –.2 | –1.1 |
| Romania | –1.9 | –2.4 | –.8 | .7 | –.7 | –2.0 |
| Bulgaria | .2 | .5 | .2 | .3 | –.4 | –1.4 |
| Total debt (billions of dollars): | | | | | | |
| Poland | 22.3 | 25.0 | 26.4 | 26.6 | 32.6 | 39.4 |
| East Germany | 11.9 | 13.4 | 13.2 | 11.0 | 11.0 | 20.3 |
| Czechoslovakia | 4.4 | 4.7 | 4.5 | 3.8 | 5.0 | 9.3 |
| Hungary | 8.3 | 9.1 | 8.7 | 7.8 | 7.8 | 11.7 |
| Romania | 7.4 | 9.6 | 10.0 | 9.4 | 10.6 | 16.2 |
| Bulgaria | 3.9 | 3.3 | 3.0 | 2.5 | 3.3 | 7.1 |
| Debt service/exports (percent): | | | | | | |
| Poland | 94 | 106 | 85 | 49 | 63 | 79 |
| East Germany | 38 | 39 | 37 | 29 | 14 | 19 |
| Czechoslovakia | 24 | 23 | 26 | 24 | 17 | 27 |
| Hungary | 29 | 28 | 49 | 50 | 34 | 43 |
| Romania | 27 | 27 | 33 | 55 | 33 | 41 |
| Bulgaria | 37 | 28 | 22 | 18 | 11 | 22 |
| Net debt/exports (percent): | | | | | | |
| Poland | 332 | 325 | 469 | 491 | 444 | 418 |
| East Germany | 248 | 212 | 164 | 116 | 77 | 121 |
| Czechoslovakia | 91 | 76 | 79 | 71 | 68 | 108 |
| Hungary | 166 | 145 | 147 | 135 | 96 | 127 |
| Romania | 132 | 147 | 136 | 151 | 127 | 153 |
| Bulgaria | 139 | 82 | 65 | 57 | 58 | 118 |
| Gross annual financing (billions of dollars): | | | | | | |
| Poland | 9.1 | 7.7 | 5.6 | 2.9 | 3.0 | 5.6 |
| East Germany | 3.0 | 3.0 | 1.4 | –.7 | 1.9 | 5.5 |
| Czechoslovakia | 1.2 | 1.1 | .5 | .2 | 1.2 | 2.6 |
| Hungary | 2.4 | 1.8 | 1.4 | .3 | 1.6 | 3.0 |
| Romania | 3.5 | 3.3 | 2.1 | 1.7 | 2.5 | 4.3 |
| Bulgaria | .8 | .0 | .2 | –.1 | .8 | 2.0 |

# MACROECONOMIC ADJUSTMENT IN EASTERN EUROPE IN 1981-83: RESPONSE TO WESTERN CREDIT SQUEEZE AND DETERIORATING TERMS OF TRADE WITH THE SOVIET UNION

By Jan Vaňous*

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## SUMMARY

During 1981-83, the economies of six East European countries—Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania—were adversely affected by two major external economic

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shocks: a Western credit squeeze and accelerated deterioration in their terms of trade with the Soviet Union. In response to the two shocks, the East European countries were forced to sharply curtail hard-currency imports in order to achieve balance-of-payments surpluses and reduce the region's hard-currency debt, which reached a peak of nearly $68 billion at the end of 1981. In addition, to counter the impact of deterioration in the terms of trade with the Soviet Union, East European countries had to boost their exports of manufactured goods in exchange for basically unchanged levels of imports of Soviet energy and raw materials.

The curtailment of hard-currency imports from non-socialist countries and the boost in ruble exports to the Soviet Union significantly reduced the availability of production inputs as well as final consumer and investment goods. This, in turn, necessitated the reduction in aggregate output produced and the amount of goods available for domestic consumption and investment. The austerity measures imposed by East European planners during 1981–82 first led to drastic curtailment of investment and subsequent cuts in personal and collective consumption. In contrast to average annual growth of net material product (NMP) of 7.6% during 1971–75 and 3.6% during 1976–80, in 1981 aggregate East European NMP declined 1.3% and in 1982 it increased only 0.1%. The largest cutbacks in domestic demand between 1980 and 1982 were imposed by planners in Poland (nearly 20%), followed by Romania (8.2%), Czechoslovakia (4.8%), East Germany (2.1%), and Hungary (0.7%). Only in Bulgaria did domestic demand increase (9.7%).

In 1983, the East European growth performance improved and the region's NMP increased an estimated 3.3%. There was an appreciable acceleration in economic growth in Czechoslovakia, East Germany, Poland, and to a lesser degree in Romania. However, Bulgaria and Hungary experienced further growth slowdown. By 1983, the combined East European hard-currency account surplus amounted to $2.0 billion compared to deficits of $7.6 billion in 1980, $5.9 billion in 1981, and $0.4 billion in 1982. Net hard-currency debt of five East European countries (excluding Poland) was reduced from $35.9 billion at the end of 1981 to $28.3 billion at the end of 1983 while the level of Polish debt remained unchanged at $25.8 billion.

The continued recovery of East European economies in 1984 and in subsequent years is unlikely without the introduction of substantive economic reforms—introduction of a rational price structure, tying incentives to profitability of production, increasing competition, and reducing the bureaucratic stranglehold of central planning—a course presently followed only by Hungary. Polish and Romanian reforms have yet to get off the ground. Bulgarian and East German reforms appear to be mostly of an institutional nature and do not offer attractive incentives to workers and management to improve labor productivity. Czechoslovakia lags behind all these countries in the introduction of any substantive measures to turn around its lethargic economy. By postponing the necessary reforms, most East European countries are running the risk of settling to a low-growth plateau of about 1.5–2.5% annually for a number of years. It is likely that such performance will lead to growing political tensions in these countries—growing dissatisfaction on the part of population over slow improvement in living standards and increased tensions within the East European political leaderships looking for a way to turn these economies around and resume faster growth.

## I. INTRODUCTION—THE MAGNITUDE OF EXTERNAL SHOCKS

### A. ACCUMULATION OF HARD-CURRENCY DEBTS DURING THE SECOND HALF OF THE 1970S

Over the past three years, the economies of Eastern Europe—Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania—were affected by two major adverse developments relating to their external financial situation: a Western credit squeeze and accelerated deterioration in their terms of trade with the Soviet Union.

During the second half of the 1970s, East European countries rapidly accumulated large hard-currency debts to the West. Whereas between 1970 and 1975 the size of gross East European hard-currency indebtedness increased by $18 billion from about $5 billion to over $23 billion, by the end of 1980 it had increased by an additional $43 billion and reached $66.4 billion.[1] The rapid buildup of East European debt during the second half of the 1970s was due to several factors.

First, given clear signals by the Soviet political leadership that efforts in the direction of Hungarian-type economic reform or the aborted Czechoslovak reform of 1967–68 were not welcome in the rest of Eastern Europe, the East European political leadership attempted to stem the secular decline in productivity and aggregate output through accelerated imports of Western technology. Sharply increased imports of Western technology were to help modernize East European industries, increase competitiveness of East European exports in Western markets, boost labor productivity, and lead to faster growth. These imports had to be financed by borrowing and the resultant debt incurred in the 1970s was to be repaid in the 1980s through accelerated exports to the West.

Second, the change in the intra-CMEA price formation formula in 1975 led to a dramatic deterioration in East European terms of trade with the Soviet Union starting in 1975 when the Soviets doubled the price of their energy exports to Eastern Europe.[2] Instead of responding to this development and earlier lesser deterioration in terms of trade with non-socialist countries by reducing imports and economic growth, the East European planners continued to press for high economic growth which required continued growth of imports from the West. In some countries, cutbacks in Soviet deliveries of raw materials were being offset by increased imports from the West. However, given the prolonged Western economic recession after 1974 and reduced demand for imports in the West, East European hard-currency export earnings did not keep up with the growth of import outlays. Consequently, a growing portion of non-technology imports was financed by borrowing.

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[1] Estimates based on those published in Table 23 in Directorate of Intelligence, CIA, "Handbood of Economic Statistics 1983," September 1983.

[2] Until 1975 intra-CMEA foreign trade prices were based on average world market prices during a preceding five-year period; for example, intra-CMEA prices in effect during 1971–74 were based on average world market prices for 1966–70. From 1975 on intra-CMEA prices are supposedly based on a lagged five-year moving average of world market prices; for example, intra-CMEA prices in effect in 1984 were constructed on the basis of average of world market prices during 1979–83.

Third, the East European political leadership—notably in the case of Poland—was under strong pressure from the population to continue the improvement in living standards even after the external economic circumstances did not justify such improvement. In the Polish case, efforts to improve the population's diet combined with deteriorating domestic agricultural performance led to rapid growth of imports of grain and other food for hard currency financed on credit.

Fourth, the acceleration in imports of Western technology subsequently forced significant acceleration in imports of other Western inputs—raw materials and semifabricates—in the late 1970s. East European planners, to their dismay, discovered that a significant portion of imported Western technology could not function with lower grade domestic substitutes for imported raw materials and, in order to utilize the imported technology, they found themselves with growing hard-currency raw material import bills.

Finally, throughout the period 1974–80, East European planners were tempted to borrow in the West because of the relatively low cost and ample supply of credit. Western banks were eager to lend to Eastern Europe because they found themselves with huge amounts of newly-deposited OPEC oil surplus funds that they needed to recycle, and Eastern Europe had a relatively low level of indebtedness by international standards. Also, East European planners were perceived as more responsible borrowers than most of their counterparts in the Third World, and the banking community operated on an assumption of a "Soviet financial umbrella" over Eastern Europe—i.e., in the event that the worst would happen and a particular country in Eastern Europe could not pay back its debts, the Soviet were expected to dip into their large reserves of gold and foreign exchange and bail that country out. In addition, just as the majority of Western lenders and Third World borrowers, East European planners did not envision the possibility of another major oil shock in 1979–80, subsequent new round of worldwide economic recession, and skyrocketing interest rates which by 1981 almost doubled the average interest burden of the debts.

### B. WESTERN CREDIT SQUEEZE

In the aftermath of the Polish hard-currency payments crisis (starting in early 1980) and similar Romanian difficulties (in the spring of 1981), Western bankers, governments, and suppliers of East European imports instituted a tight credit squeeze on these economies. The main elements of this were sharp curtailment of short-term credits, more gradual curtailment of medium- and long-term credits, and significant decline in loan rollovers so as to force a reduction in net indebtedness. The state of the capital accounts—which reflected the preferences of Western bankers and government lending officials for reduced credit exposure in Eastern Europe—in turn determined the permissible level of hard-currency current account deficits or the required level of current account surpluses in individual countries. This, in turn, dictated a particular level of hard-currency trade deficits or surpluses. Given the depressed demand for East European exports in the West and in the Third World in the early 1980s, in order to reduce hard-currency trade deficits/earn supluses, East European planners were forced to adopt deflationary economic policies, resulting in a substantial reduction in domestic absorption.[3] Only by adopting these policies were economies of Eastern Europe able to operate with signficantly lower levels of hard-currency imports and free certain goods for exports which would otherwise have been used domestically.

### C. DETERIORATION IN TERMS OF TRADE WITH THE SOVIET UNION

The second shock delivered to Eastern Europe, on top of the first one outlined above, was the sharp deterioration in its terms of trade with the Soviet Union during 1981-83.[4] This deterioration was a result of the rapid growth in prices of Soviet energy exports vis-a-vis prices of East European machinery and industrial consumer goods, reflecting similar deterioration in world market terms of trade that took place during 1979-80.[5] Following a nearly 50% increase in the world market dollar price of oil in 1979 and an additional 65% increase in 1980, the average Soviet ruble price of oil to Eastern Europe increased about 30-45% (depending on the country) in 1981 and an additional 19-27% in 1982. Even though the world market dollar price of oil increased only 11% in 1981 before declining by an average of 1% in 1982 and an additional 12% in 1983, the average Soviet ruble price of oil increased 17-20% in 1983 relative to 1982.

Compared to 1980, a conservative estimate of the deterioration in East European terms of trade with the Soviet Union is 6% annually during 1981-82 and 4% in 1983, implying a cumulative deterioration of nearly 15% since 1980.[6] Of all the East European countries, only Romania was not seriously affected by the deterioration in terms of its trade with the Soviet Union because it imports only a small amount of fuels from the Soviets (natural gas, coal, and coke at preferential prices for rubles and occasionally some oil at prevailing world market prices for dollars) and the share of its imports from the Soviet Union in total imports is significantly smaller than for other East European countries.[7]

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[3] The term domestic absorption refers to the amount of goods and services consumed or invested domestically.

[4] The term "terms of trade" refers to the ratio of export to import prices, or the ratio of the export price index to the import price index. An increase in this ratio indicates rising gains from trade and hence improving overall welfare of a particular economy; a decline indicates the opposite.

[5] It should be noted that intra-CMEA foreign trade prices are based on a lagged five-year moving average of world market dollar prices converted into rubles at the official Soviet ruble/dollar exchange rate for each year.

[6] Our rough estimate is that prices of East European exports to the Soviet Union increased by 8.5% in 1981, 6.5% in 1982, and 6.0% in 1983. In contrast, prices of East European imports from the Soviet Union increased by 15% in 1981, 13% in 1982, and 10.5% in 1983. These estimates are based on official Hungarian and Polish ruble/socialist commodity trade price indices re-aggregated by a set of weights corresponding to the commodity composition of Soviet exports to and imports from Eastern Europe.

[7] However, Romania suffered a severe deterioration in its terms of hard-currency trade because of the near tripling of dollar oil prices between 1978 and 1981, which was not compensated for by a similar increase in prices of its refined oil product and other exports to the West.

The need to curtail the growth of nominal ruble trade deficits with the Soviet Union had an effect on East European economies similar to that of trying to increase hard-currency trade surpluses. If the growth in nominal ruble trade deficits were to be avoided, the same quantity of imports from the Soviet Union had to be offset by a larger quantity of exported manufactures to compensate for higher-price imports (mostly energy). In fact, the Soviet pressure to reduce its nominal surpluses in trade with Eastern Europe in 1982-83 further increased the pressure on Eastern Europe to boost the physical quantity of export deliveries. In order to free additional manufactured goods for exports to the Soviet Union, even deeper deflation of East European economies and the resultant reduction in domestic absorption was necessary.

### D. ADJUSTMENT IN HARD-CURRENCY BALANCE OF PAYMENTS AND DEBT

The size of the required external financial adjustment by individual East European countries over the past three years is illustrated in the four tables presented below.

With regard to the hard-currency trade balance, current account balance, and debt adjustment, which are illustrated in Tables 1 through 3, six East European countries—Bulgaria, Czechoslovakia, East Germany, Hungary, and Poland—had an aggregate non-socialist trade deficit of close to $4.0 billion in 1980, but in 1981 this was turned into a surplus of slightly under $0.5 billion, in 1982 the surplus surged to $5.1 billion and in 1983 it reached $5.3 billion. Thus, over a three-year period, the six East European countries succeeded in improving their combined non-socialist trade balance by $9.3 billion. It is important to note that since the current dollar value of East European exports to the West stagnated—mostly due to the dramatic fall in the value of Polish exports—the entire improvement in the aggregate East European trade balance with non-socialist countries was due to drastic import cutbacks. The aggregate value of East European imports from non-socialist countries declined from $34.5 billion in 1980 to $30.0 billion in 1981, $25.1 billion in 1982, and $25.6 billion in 1983. However, slightly more than one-half of the reduction in total East European imports from these countries between 1980 and 1983 was due to the reduction in Polish imports.[8]

TABLE 1.—EAST EUROPEAN AND SOVIET NON-SOCIALIST AND HARD-CURRENCY TRADE, 1980–83

[In millions of dollars]

| Country | Non-Socialist trade | | | | Hard-currency trade | | | |
|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | 1982 | 1983 | 1980 | 1981 | 1982 | 1983 |
| | EXPORTS (fob) | | | | | | | |
| Bulgaria | 3,027 | 3,307 | 3,289 | 2,959 | NA | NA | NA | NA |
| Czechoslovakia | 4,526 | 4,300 | 4,096 | 4,179 | NA | NA | NA | NA |

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[8] One should be aware that, at least in part, the reduction in the dollar value of East European imports from non-socialist countries during 1981-83 is attributable to the extraordinary strength of the dollar, which is responsible for reducing the dollar value of imports denominated in major West European currencies. In fact, aggregate East European imports from non-socialist countries probably increased 7-9% in real terms in 1983 in view of the significant decline in average dollar prices level in East-West trade.

## TABLE 1.—EAST EUROPEAN AND SOVIET NON-SOCIALIST AND HARD-CURRENCY TRADE, 1980–83—Continued

[In millions of dollars]

| Country | Non-Socialist trade | | | | Hard-currency trade | | | |
|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | 1982 | 1983 | 1980 | 1981 | 1982 | 1983 |
| East Germany | 5,277 | 6,714 | 7,875 | [1] 8,495 | NA | NA | NA | NA |
| Hungary [2] | 3,690 | 3,642 | 3,782 | 3,984 | 4,939 | 4,877 | 4,973 | 4,989 |
| Poland | 7,496 | 5,446 | 5,206 | 5,231 | 7,974 | 5,772 | 5,741 | 5,870 |
| Romania | 6,322 | 7,112 | 6,006 | 6,028 | 6,574 | 7,281 | 6,235 | 6,258 |
| Eastern Europe | 30,538 | 30,521 | 30,254 | 30,876 | NA | NA | NA | NA |
| Soviet Union | 35,020 | 36,081 | 39,911 | 40,460 | [1] 31.411 | [1] 32,027 | [1] 35,862 | [1] 36,128 |
| CMEA 7 | 65,558 | 66,602 | 70,165 | 71,336 | NA | NA | NA | NA |
| IMPORTS (fob) | | | | | | | | |
| Bulgaria | 2,039 | 2,656 | 2,644 | 2,364 | NA | NA | NA | NA |
| Czechoslovakia | 4,519 | 3,983 | 3,612 | 3,403 | NA | NA | NA | NA |
| East Germany | 6,932 | 6,654 | 6,366 | [1] 7,525 | NA | NA | NA | NA |
| Hungary [3] | 4,568 | 4,430 | 4,123 | 4,034 | 5,041 | 4,959 | 4,514 | 4,455 |
| Poland | 8,477 | 5,421 | 3,763 | 3,733 | 8,969 | 5,868 | 4,309 | 4,377 |
| Romania | 7,973 | 6,902 | 4,604 | 4,501 | 8,091 | 7,065 | 4,710 | 4,605 |
| Eastern Europe | 34,508 | 30,046 | 25,112 | 25,560 | NA | NA | NA | NA |
| Soviet Union | 32,065 | 36,043 | 35,260 | 34,897 | [1] 30,121 | [1] 33,225 | [1] 32,756 | [1] 32,318 |
| CMEA 7 | 66,573 | 66,089 | 60,372 | 60,457 | NA | NA | NA | NA |
| TRADE BALANCE (fob experts minus fob imports) | | | | | | | | |
| Bulgaria | 988 | 651 | 645 | 595 | NA | NA | NA | NA |
| Czechoslovakia | 7 | 317 | 484 | 776 | NA | NA | NA | NA |
| East Germany | –1,655 | 60 | 1,509 | [1] 970 | NA | NA | NA | NA |
| Hungary [4] | –678 | –788 | –341 | –50 | –102 | –82 | 459 | 534 |
| Poland | –981 | 25 | 1,443 | 1,498 | –995 | –96 | 1,432 | 1,493 |
| Romania | –1,651 | 210 | 1,402 | 1,527 | –1,517 | 216 | 1,525 | 1,653 |
| Eastern Europe | –3,970 | 475 | 5,142 | 5,316 | NA | NA | NA | NA |
| Soviet Union | 2,955 | 38 | 4,651 | 5,563 | [1] 1,290 | [1] –1,198 | [1] 3,106 | [1] 3,810 |
| CMEA 7 | –1,015 | 513 | 9,793 | 10,879 | NA | NA | NA | NA |

[1] Wharton estimate.
[2] Fob exports reported by region of destination.
[3] Cif imports reported by region of origin.
[4] Fob exports minus cif imports.

Source: Official Soviet and East European foreign trade statistics.

## TABLE 2.—DEVELOPMENTS IN EAST EUROPEAN AND SOVIET HARD-CURRENCY BALANCE OF PAYMENTS, 1980–83

[In millions of dollars]

| Country | 1980 | 1981 | 1982 | 1983 [1] |
|---|---|---|---|---|
| HARD-CURRENCY CURRENT ACCOUNT BALANCE | | | | |
| Bulgaria | 587 | 183 | 399 | 585 |
| Czechoslovakia | –502 | –293 | 48 | 509 |
| East Germany | –2,334 | –1,125 | 884 | 936 |
| Hungary | –368 | –727 | –63 | 297 |
| Romania | –2,399 | –818 | 655 | 922 |
| CMEA 5 | –5,016 | –2,780 | 1,923 | 3,249 |
| Poland [2] | –2,612 | –3,115 | –2,330 | –1,208 |
| Eastern Europe | –7,628 | –5,895 | –407 | 2,041 |

## TABLE 2.—DEVELOPMENTS IN EAST EUROPEAN AND SOVIET HARD-CURRENCY BALANCE OF PAYMENTS, 1980–83—Continued

[In millions of dollars]

| Country | 1980 | 1981 | 1982 | 1983 [1] |
|---|---|---|---|---|
| Soviet Union | 2,967 | 1,095 | 4,902 | 4,678 |
| CMEA 7 | −4,661 | −4,800 | 4,495 | 6,719 |
| **HARD-CURRENCY TRADE BALANCE ON PAYMENTS BASIS** | | | | |
| Bulgaria | 686 | 310 | 388 | 420 |
| Czechoslovakia | 39 | 253 | 420 | 688 |
| East Germany | −1,655 | 3 | 1,437 | 903 |
| Hungary | 276 | 445 | 766 | 877 |
| Romania | −1,534 | 204 | 1,525 | 1,653 |
| CMEA 5 | −2,188 | 1,215 | 4,536 | 4,541 |
| Poland | −792 | −751 | 358 | 1,030 |
| Eastern Europe | −2,980 | 464 | 4,894 | 5,571 |
| Soviet Union | 1,290 | −1,198 | 3,106 | 3,810 |
| CMEA 7 | −1,690 | −734 | 8,000 | 9,381 |
| **SERVICES, REMITTANCES, INTEREST, GOLD SALES** | | | | |
| Bulgaria | −99 | −127 | 11 | 165 |
| Czechoslovakia | −541 | −546 | −372 | −179 |
| East Germany | −679 | −1,128 | −553 | 33 |
| Hungary | −644 | −1,172 | −829 | −580 |
| Romania | −865 | −1,022 | −870 | −731 |
| CMEA 5 | −2,828 | −3,995 | −2,613 | −1,292 |
| Poland [2] | −1,820 | −2,364 | −2,688 | −2,238 |
| Eastern Europe | −4,648 | −6,359 | −5,301 | −3,530 |
| Soviet Union | 1,677 | 2,293 | 1,796 | 868 |
| CMEA 7 | −2,971 | −4,066 | −3,505 | −2,662 |

[1] Preliminary Wharton estimate.
[2] Including interest arrears to Western governments.

Note.—Hard-currency trade balance on payments basis reported above is generally different from non-socialist trade balance of hard-currency trade balance reported on customs basis (see Table 1 above). Non-socialist trade balance includes non-convertible currency trade transactions with developing countries but excludes convertible-currency trade transactions with socialist countries. The difference between hard-currency trade balance reported on customs and payments basis is generally attributable to differences in treatment of certain transport costs, construction services (in the case of Poland these are included in customs statistics), and differences between the time goods physically leave or arrive in the country and the time payments for exports are received by the Foreign Trade or National Banks or payments for imports are made by these banks.

Source: Hungary, Poland, Romania: official balance of payments statistics supplied to Western commercial banks and IMF (official Polish statistics for 1981–83 were corrected to include interest arrears to Western governments); other countries: Wharton Centrally Planned Economies Service, "Centrally Planned Economies Balance of Payments and Debt Report," Spring 1984.

## TABLE 3.—DEVELOPMENTS IN EAST EUROPEAN AND SOVIET HARD-CURRENCY DEBT, 1980–83

[In million dollars at the end of period]

| Country | Gross debt | | | | Net debt [2] | | | |
|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | 1982 | 1983 [1] | 1980 | 1981 | 1982 | 1983 [1] |
| **TO ALL CREDITORS** | | | | | | | | |
| Bulgaria | 3,560 | 3,060 | 2,760 | 2,265 | 2,781 | 2,230 | 1,746 | 1,095 |
| Czechoslovakia | 4,760 | 4,510 | 4,140 | 3,930 | 3,504 | 3,413 | 3,398 | 2,730 |
| East Germany | 14,410 | 14,860 | 13,040 | 12,067 | 12,264 | 12,680 | 11,054 | 9,467 |
| Hungary | 9,090 | 8,699 | 7,715 | 8,250 | 7,698 | 7,782 | 6,968 | 6,950 |
| Romania | 9,557 | 10,160 | 9,766 | 8,428 | 9,265 | 9,825 | 9,395 | 8,018 |
| CMEA 5 | 41,377 | 41,289 | 37,421 | 34,940 | 35,512 | 35,930 | 32,561 | 28,260 |
| Poland | 25,000 | [3] 26,411 | [3] 27,352 | 26,999 | 24,354 | [3] 25,614 | [3] 26,307 | 25,769 |
| Eastern Europe | 66,377 | 67,700 | 64,773 | 61,939 | 59,866 | 61,544 | 58,868 | 54,029 |

## TABLE 3.—DEVELOPMENTS IN EAST EUROPEAN AND SOVIET HARD-CURRENCY DEBT, 1980–83—Continued

[In million dollars at the end of period]

| Country | Gross debt | | | | Net debt [2] | | | |
|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | 1982 | 1983 [1] | 1980 | 1981 | 1982 | 1983 [1] |
| Soviet Union | 17,900 | 20,900 | 20,100 | 20,300 | 9,718 | 12,520 | 9,986 | 9,100 |
| CMEA banks | [1]4,640 | [1]4,250 | [1]3,790 | 3,800 | [1]4,250 | [1]3,950 | [1]3,550 | 3,550 |
| CMEA 7 | 88,917 | 92,850 | 88,663 | 86,039 | 73,834 | 78,014 | 72,404 | 66,679 |
| TO BIS-AREA BANKS | | | | | | | | |
| Bulgaria | 2,876 | 2,371 | 2,067 | 1,590 | 2,097 | 1,541 | 1,053 | 420 |
| Czechoslovakia | 3,545 | 3,319 | 2,848 | 2,600 | 2.289 | 2,222 | 2,106 | 1,400 |
| East Germany | 9,928 | 10,729 | 8,859 | 8,150 | 7,782 | 8,549 | 6,873 | 5,550 |
| Hungary | 8,002 | 7,714 | 6,757 | 6,450 | 6,610 | 6,797 | 6,010 | 5,150 |
| Romania | 5,776 | 5,067 | 4,243 | 3,490 | 5,484 | 4,732 | 3,872 | 3,080 |
| CMEA 5 | 30,127 | 29,200 | 24.774 | 22,280 | 24,262 | 23,841 | 19,914 | 15,600 |
| Poland | 16,173 | 15,228 | 13,910 | 12,000 | 15,527 | 14,431 | 12,865 | 10,770 |
| Eastern Europe | 46,300 | 44,428 | 38,684 | 34,280 | 39,789 | 38,272 | 32,779 | 26,370 |
| Soviet Union | [1]8,798 | [1]12,028 | [1]10,806 | 10,000 | [1]616 | [1]3,648 | [1]692 | −1,200 |
| CMEA banks | [1]4,640 | [1]4,250 | [1]3,790 | 3,800 | [1]4,250 | [1]3,950 | [1]3,550 | 3,550 |
| CMEA 7 | 59,738 | 60,706 | 53,280 | 48,080 | 44,655 | 45,870 | 37,021 | 28,720 |
| TO OTHER CREDITORS | | | | | | | | |
| Bulgaria | 684 | 689 | 693 | 675 | 684 | 689 | 693 | 675 |
| Czechoslovakia | 1,215 | 1,191 | 1,292 | 1,330 | 1,215 | 1,191 | 1,292 | 1,330 |
| East Germany | 4,482 | 4,131 | 4,181 | 3,917 | 4,482 | 4,131 | 4,181 | 3,917 |
| Hungary | 1,088 | 985 | 958 | [3]1,800 | 1,088 | 985 | 958 | [3]1,800 |
| Romania | 3.781 | 5,093 | 5,523 | 4,938 | 3,781 | 5,093 | 5,523 | 4,938 |
| CMEA 5 | 11,250 | 12,089 | 12,647 | 12,660 | 11,250 | 12,089 | 12,647 | 12,660 |
| Poland | 8,827 | 11,183 | 13,442 | 14,999 | 8,827 | 11,183 | 13,442 | 14,999 |
| Eastern Europe | 20,077 | 23,272 | 26,089 | 27,659 | 20,077 | 23,272 | 26,089 | 27,659 |
| Soviet Union | 9,102 | 8,872 | 9,294 | 10,300 | 9,102 | 8,872 | 9,294 | 10,300 |
| CMEA banks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CMEA 7 | 29,179 | 32,144 | 35,383 | 37,959 | 29,179 | 32,144 | 35,383 | 37,959 |

[1] Wharton estimate.

[2] Gross debt minus deposits of CMEA countries in BIS-area banks. Note that this considerably overstates the actual level of net indebtedness of these countries because it does not take into account certain hard-currency assets held by these countries abroad—supplier credits granted to Western importers (mostly for capital goods), hard-currency credits granted to developing countries, deposits held by banks outside BIS area, etc. The upward bias in the reported net debt figure is known to be most severe for the Soviet Union and Hungary. To a lesser degree, it also affects estimates of net debt for Bulgaria, Czechoslovakia, and Romania.

[3] The sharp increase in Hungarian debt to other debtors in 1983 reflects borrowing from the IMF and the World Bank and the surge in short-term offshore borrowing at the end of December 1983 to bolster the country's reserve picture (increase deposits in BIS-area banks without a corresponding increase in BIS-area bank liabilities).

Source: Total debt—Bulgaria, Czechoslovakia, East Germany, Soviet Union: Directorate of Intelligence, Central Intelligence Agency, "Handbook of Economic Statistics," September 1983; CMEA banks: Wharton CPE Current Analysis, No. 44 of June 13, 1983; Hungary, Poland, Romania: official debt figures supplied to Western bankers and IMF. (Note that total Polish debt includes estimated interest arrears to Western governments previously not included in official Polish debt statistics.) BIS-area bank debt—semiannual BIS statistics. Other debt—residual category calculated as the difference between total debt and BIS-area bank debt.

The improvement in East European hard-currency balance of payments, which is outlined in Table 2 below, paralleled the improvement in the non-socialist trade balance. Whereas in 1980 the combined current account deficit of six East European countries amounted to $7.6 billion in 1981 it was reduced to $5.9 billion, in 1982 it amounted to a mere $0.4 billion and in 1983 Eastern Europe achieved an aggregate current account surplus estimated at $2.0 billion. It is important to point out that the aggregate payments picture for Eastern Europe obscures the much more rapid improvement in the balance-of-payments position of five East European countries in contrast to that for Poland. These five countries ran a combined current account deficit of $5.0 billion in 1980, which they reduced to $2.8 billion in 1981, and since then have earned significant surpluses—$1.9 billion in 1982 and an estimated $3.2 billion in 1983. In contrast, the Polish current account deficit peaked in 1981 at $3.1 billion before declining to $2.3 billion in 1982 and $1.2 billion in 1983.[9]

The developments in gross and net hard-currency debt of East European countries between the end of 1980 and the end of 1983 are summarized in Table 3. Total indebtedness of each country is disaggregated into debt incurred to BIS-area banks and to other creditors. The former group is comprised of commercial banks in Western Europe, the United States, Canada, and Japan.[10] The latter group is comprised of Western governments, Middle Eastern Governments, governments of certain developing countries (notably Brazil and Argentina), banks outside the BIS area,[11] and the IMF and the World Bank (in the case of Hungary and Romania), Western suppliers, and finally certain obligations to other socialist countries (mostly hard-currency debts owed by one CMEA country to another, including obligations to two CMEA banks).

The BIS data in Table 3 indicate that over a period of three years—between the end of 1980 and end-1983—the aggregate gross East European liabilities to Western commercial banks declined by an etimated $12.0 billion (26.0%) and net liabilities declined by an even larger amount—$13.4 billion (33.7%). However, the total gross hard-currency indebtedness of Eastern Europe to all creditors declined only by $4.4 billion (6.7%) during the above period as debt to creditors other than BIS-area banks surged by $7.6 billion (nearly 38%). But the discussion of an aggregate picture of East European indebtedness is highly misleading because of the inclusion of Poland. Poland has been the only East European country unable to pay all the interest on its debt and that is why its debt has in fact been slowly increasing in spite of the dramatic exchange rate effect, which sharply reduced the dollar value of Polish non-dollar liabilities due to the strength of the dollar vis-a-vis major West European currencies.

If we concentrate on the debt adjustment achieved by five East European countries other than Poland, we find that it was indeed quite significant. The size of gross debt of the CMEA Five to Western commercial banks declined by $7.8 billion (26.0%) between end-1980 and end-1983. Gross hard-currency indebtedness to other creditors is estimated to have increased by about $1.4 billion (12.5%) during the same period. Total gross hard-currency indebtedness declined by $6.4 billion (15.6%). However, it is still important to stress that only a portion of the reduction in hard-currency indebtedness was achieved by acutal repayment of debt through the generation of current account surpluses. A factor at least equally important for the fall in the dollar value of East European debt was the strength of the dollar which substantially reduced the dollar value of non-dollar liabilities.[12]

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[9] These estimates of current account deficits are significantly higher than the official Polish figures because they include interest accrued but not paid, while the official Polish hard-currency balance-of-payments figures include only actual interest payments made.

[10] The BIS figures exclude East German debt to West German commercial banks. Some of the indebtedness reported by Western commercial banks to BIS includes East European and Soviet obligations insured by Western government credit insurance agencies. Therefore, the BIS figures significantly overstate the amounts at risk on account of these banks.

[11] In the case of East Germany, debt to West German banks is included in this group, i.e., it is treated as debt to banks outside the BIS area.

### E. ADJUSTMENTS IN TRADE RELATIONS WITH THE SOVIET UNION

The developments in East European trade relations with the Soviet Union during 1980–83 are summarized in Table 4.[13] Soviet exports and imports are reported both in current ruble terms and in terms of constant 1980 rubles. In addition, in the case of Hungary, Poland, and Romania—which conduct a portion of their trade with the Soviet Union in hard currency—an effort was made to separate genuine ruble trade transactions at special intra-CMEA prices and dollar trade transactions at prevailing world market prices. The latter transactions were converted into rules using official Soviet dollar/ruble exchange rates.

TABLE 4.—SOVIET TRADE WITH EASTERN EUROPE, 1980–83

[In millions of rubles]

| Country | Type of trade | In current rubles | | | | In constant 1980 rubles [1] | | |
|---|---|---|---|---|---|---|---|---|
| | | 1980 | 1981 | 1982 | 1983 | 1981 | 1982 | 1983 |
| | | EXPORTS | | | | | | |
| Bulgaria | All | 3,660 | 4,375 | 4,885 | 5,511 | 3,804 | 3,758 | 3,840 |
| Czechoslovakia | All | 3,648 | 4,382 | 5,048 | 5,872 | 3,810 | 3,883 | 4,092 |
| East Germany | All | 4,873 | 5,526 | 6,420 | 6,798 | 4,805 | 4,938 | 4,737 |
| Hungary | All | 2,982 | 3,307 | 3,707 | 4,058 | NA | NA | NA |
| | Ruble [2] | 2,892 | 3,191 | 3,655 | 4,008 | 2,775 | 2,812 | 2,037 |
| | Dollar [3] | 90 | 116 | 52 | [4] 50 | NA | NA | NA |
| Poland | All | 4,406 | 4,931 | 4,813 | 5,274 | NA | NA | NA |
| | Ruble [2] | 4,399 | 4,925 | 4,812 | 5,273 | 4,283 | 3,702 | 3,675 |
| | Dollar [3] | 7 | 6 | 1 | [4] 1 | NA | NA | NA |
| Romania | All | 1,350 | 1,779 | 1,424 | 1,640 | NA | NA | NA |
| | Ruble [2] | 1,110 | 1,273 | 1,372 | 1,500 | 1,157 | 1,153 | 1,172 |
| | Dollar [3] | 240 | 506 | 52 | [4] 140 | NA | NA | NA |
| Eastern Europe | All | 20,919 | 24,300 | 26,297 | 29,153 | NA | NA | NA |
| | Ruble [2] | 20,582 | 23,672 | 26,192 | 28,962 | 20,634 | 20,246 | 20,309 |
| | Dollar [3] | 337 | 628 | 105 | [4] 191 | NA | NA | NA [2] |
| | | IMPORTS | | | | | | |
| Bulgaria | All | 3,439 | 3,697 | 4,288 | 5,053 | 3,407 | 3,713 | 4,125 |
| Czechoslovakia | All | 3,536 | 4,105 | 4,732 | 5,420 | 3,783 | 4,097 | 4,425 |

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[12] For example, between the end of 1980 and the end of 1983, the value of the dollar increased 39% against the DM, 64% against the British pound, and 85% against the French franc. Consequently, depending on the share of East debt denominated in these currencies, the dollar value of that debt declined by as corresponding amount.

[13] The trade figures reported in Table 4 are based on official Soviet rather than East European trade statistics. Therefore they are reported on the basis of country of destination for exports and country of origin for imports rather than on the basis of country of sale for exports and country of purchase for imports, as is the practice in Bulgaria, Czechoslovakia, East Germany, and Poland. Additional differences between Soviet and mirror East European statistics of Soviet-East European trade reflect different ways in which ruble and hard-currency trade transactions are aggregated (the Soviets use official ruble/dollar cross-exchange rates while some of the East European countries—notably Hungary, Poland, and Romania—use more realistic commercial ruble/dollar cross-exchange rates), minor valuation differences, and (timing) differences in recording of trade transactions.

### TABLE 4.—SOVIET TRADE WITH EASTERN EUROPE, 1980–83—Continued

[In millions of rubles]

| Country | Type of trade | In current rubles | | | | In constant 1980 rubles [1] | | |
|---|---|---|---|---|---|---|---|---|
| | | 1980 | 1981 | 1982 | 1983 | 1981 | 1982 | 1983 |
| East Germany | All | 4,327 | 5,155 | 5,776 | 6,596 | 4,751 | 5,001 | 5,384 |
| Hungary | All | 2,757 | 3,300 | 3,746 | 4,007 | NA | NA | NA |
| | Ruble [2] | 2,397 | 2.808 | 3,275 | 3,637 | 2,588 | 2,835 | 2,969 |
| | Dollar [3] | 360 | 492 | 471 | [4] 370 | NA | NA | NA |
| Poland | All | 3,596 | 3,221 | 4,097 | 4,787 | NA | NA | NA |
| | Ruble [2] | 3,589 | 3,216 | 4,094 | 4,789 | 2,964 | 3,545 | 3,906 |
| | Dollar [3] | 7 | 5 | 3 | [4] 2 | NA | NA | NA |
| Romania | All | 1,441 | 1,673 | 1,683 | 1,665 | NA | NA | NA |
| | Ruble [2] | 1,133 | 1,158 | 1,523 | 1,525 | 1,067 | 1,319 | 1,245 |
| | Dollar [3] | 308 | 515 | 160 | [4] 140 | NA | NA | NA |
| Eastern Europe | All | 19,096 | 21,151 | 24,322 | 27,528 | NA | NA | NA |
| | Ruble [2] | 18,421 | 20,139 | 23,688 | 27,016 | 18,560 | 20,510 | 22,054 |
| | Dollar [3] | 675 | 1,012 | 634 | [4] 512 | NA | NA | NA |
| TRADE BALANCE | | | | | | | | |
| Bulgaria | All | 221 | 678 | 597 | 458 | 397 | 45 | −285 |
| Czechoslovakia | All | 112 | 277 | 316 | 452 | 27 | −314 | −333 |
| East Germany | All | 546 | 371 | 644 | 202 | 54 | −63 | −647 |
| Hungary | All | 225 | 7 | −39 | 51 | NA | NA | NA |
| | Ruble [2] | 495 | 383 | 380 | 371 | 187 | −23 | −176 |
| | Dollar [3] | −270 | −376 | −419 | −320 | NA | NA | NA |
| Poland | All | 810 | 1,710 | 716 | 487 | NA | NA | NA |
| | Ruble [2] | 810 | 1,709 | 718 | 488 | 1,319 | 157 | −231 |
| | Dollar [3] | 0 | 1 | −2 | −1 | NA | NA | NA |
| Romania | All | −91 | 106 | −259 | −25 | NA | NA | NA |
| | Ruble [2] | −23 | 115 | −151 | −25 | 90 | −166 | −73 |
| | Dollar [3] | −68 | −9 | −108 | [4] 0 | NA | NA | NA |
| Eastern Europe | All | 1,823 | 3,149 | 1,975 | 1,625 | NA | NA | NA |
| | Ruble [2] | 2,161 | 3,533 | 2,504 | 1,946 | 2,074 | −264 | −1,745 |
| | Dollar [3] | −338 | −384 | −529 | [4] −321 | NA | NA | NA |

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[1] The following value of the Soviet export deflator (1980 = 100) was assumed for all East European countries except Romania: 1981 = 115.0, 1982 = 130.0, and 1983 = 143.5. Due to the relatively low share of fuels in Soviet exports to Rominia, the values of Soviet export deflator were assumed to be: 1981 = 110.0, 1982 = 119.0, and 1983 = 128.0. The Soviet import deflator was assumed to have the same value for all East European countries: 1981 = 108.5, 1982 = 115.5, and 1983 = 122.5.

[2] Wharton estimate of the volume of ruble-demoniated transactions at special intra-CMEA prices.

[3] Wharton estimate of the volume of dollar-denominated transactions at prevailing world market prices. The dollar value of these transactions was converted into rubles at official Soviet dollar/ruble exchange rates, namely: $1.541 per 1 ruble in 1980, $1.392 in 1981, $1.377 in 1982, and $1.346 in 1983.

[4] Preliminary Wharton estimate.

Source: Official Soviet foreign trade statistics for ruble trade flows in current prices. Estimates of dollar trade flows were made on the basis on official mirror Hungarian statistics of dollar trade with soialist countries (other than China and Yugoslavia) and mirror Romanian statistics of dollar trade with Soviet Union. Estimates of ruble trade flows in constant 1980 prices were prepared on the basis of estimates of Soviet export and import prices, which were in turn based on official disaggregated Hungarian and Polish price indices for ruble/socialist trade aggregated on the basis of the actual commodity composition of Soviet-East European trade.

Focusing our attention on the developments in the aggregate nominal Soviet trade balance in ruble transactions with Eastern Europe, we see that the Soviet trade surplus peaked in 1981 when it amounted to over 3.5 billion rubles—an increase of nearly 1.4 billion over its 1980 level. In 1982, this surplus declined to 2.5 billion rubles and in 1983 it was reduced further to 1.9 billion rubles. It is worth noting that almost four-fifths of the entire reduction in the Soviet surplus of 1.6 billion rubles between 1981 and 1983 was due to the dramatic curtailment by the Soviets of the surplus with Poland. In fact, if we look at the pattern of Soviet trade surplus with the five remaining East European countries, we find that its nominal level was quite stable in recent years—it amounted to 1.35 billion rubles in 1980, 1.8 billion rubles annually in 1981–82, and

1.45 billion rubles in 1983. Thus, over the past three years, the level of nominal trade deficit of the CMEA Five with the Soviet Union remained roughly constant, thereby forcing these countries to absorb fully the impact of a 15% deterioration in terms of trade with the Soviet Union.

In order to better understand the burden of deterioration in East European terms of trade with the Soviet Union, one should look at what happened to net Soviet real resource outflow to Eastern Europe in terms of constant 1980 prices. While the quantity of Soviet exports to Eastern Europe declined slightly in real terms over the past three years (following no growth in 1981, these declined about 2% in 1982-83) and the quantity of Soviet imports from Eastern Europe increases significantly (following less than 1% growth in 1981, these increased 10-11% in 1982 and an additional 7-8% in 1983). In terms of 1980 prices, the East European trade deficit with the Soviet Union—calculated as the difference between exports and imports both measured in constant prices—was eliminated by 1982 and turned into a significant surplus in 1983. This is indicated by the following figures: in 1980 the Soviet trade surplus with Eastern Europe (including Poland) measured in 1980 prices amounted to 2.2 billion rubles, in 1981 it stood at 2.1 billion rubles, in 1982 it turned into a deficit of 0.3 billion rubles, and in 1983 it amounted to a deficit of 1.7 billion rubles. Thus, net real resource outflow from the Soviet Union into Eastern Europe in 1980-81 turned into a rapidly increasing inflow in 1982-83. Measured in terms of what economists call gross barter terms of trade—the ratio of the growth in real imports over real exports—by 1983 Eastern Europe has suffered a deterioration of 18% and the Soviet Union experienced an improvement of 21% in these terms of trade. In other words, in order to secure roughly the same quantity of imports as in 1980, by 1983 Eastern Europe has to increase the quantity of its exports to the Soviet Union by about 21%. And, even this increase in East European exports to the Soviet Union was not sufficient to eliminate entirely the nominal East Europe ruble trade deficit with the Soviet Union.

## II. POSSIBLE MACROECONOMIC RESPONSES BY CENTRAL PLANNERS TO ADVERSE EXTERNAL TRADE AND PAYMENTS DEVELOPMENTS

The East European need to earn substantial hard-currency trade surpluses and the impact of deteriorating terms of trade with the Soviet Union reinforced each other in requiring a reduction in national income used for domestic consumption and investment relative to national income produced. This meant that either the growth of the former had to fall below the growth of the latter or domestic absorption had to fall in absolute terms. (A non-specialist reader is referred to the "Note on National Income Accounting in East European Countries," presented in the Appendix, which provides a more detailed explanation of the reasoning behind this conclusion.)

In general, the first choice available to an East European planner facing the need to implement austerity measures is either to cut consumption or net investment (accumulation). With regard to consumption, a cut can be made either in personal (individual) consumption or collective (social) consumption. If accumulation is to be cut, the choice is to cut one or more of its three main components—new fixed capital formation (new capital put into operation), change in the stock of unfinished construction, or investment in inventories.

Each of the possible austerity measures has its advantages and drawbacks. Personal consumption is the largest component of national income used and if a drastic reduction in domestic absorption in necessary, it is the most likely candidate for a cutback. However, any significant cutback in personal consumption could have serious immediate political repercussions and has to be viewed as potentially most dangerous for regimes which depend on a continuous improvement or at least maintenance of living standards as a basis of their legitimacy. In centrally planned economics, a reduction in living standards is also likely to lead to a reduction in the effective supply of labor (i.e., intensity of work) and result in declining labor productivity and overall output level. Even if the decline in overall output is not necessarily reflected in reduced quantity of goods produced, their quality is likely to decline as work attitudes worsen, labor morale deteriorates, and the share of shoddy products increases. The serious danger associated with a major cutback in living standards is in sending the economy into a downward spiral when lower living standards lead to lower productivity, which leads to lower overall output (measured correctly inclusive of deterioration in the quality of production), and thus to a further decline in living standards.

The policy of substantial curtailment of collective consumption is generally not used by planners because it is not politically and socially feasible to dramatically reduce material consumption of the social service sector (health, education, culture, etc.). One component could be cut—material consumption of the defense sector (other than military capital goods). Although this might prove beneficial to the economy as a whole and might even be desired by some East European political leaders, this is generally not a decision that can be made without consulting the Soviets—Romania being a notable exception in this case. Because of sharply increased tensions between the United States and the Soviet Union at the beginning of the 1980s, the Soviets have been unwilling to entertain such a policy option for Eastern Europe. In any case, given the relatively low share of material consumption of the defense sector relative to the capital cost in total defense spending, even major cutbacks in this consumption and/or in material consumption of other social services would still have a relatively small effect on total domestic absorption.

A reduction in the growth of inventories or, in the extreme case, actual reduction in absolute level of inventories (i.e., inventory disinvestment) is generally viewed as the first line of defense by central planners when domestic absorption is to be reduced. Because of well-known rigidities of central planning and the poor supply responsiveness of enterprises, these economies operate with much higher inventory levels than market economies at comparable levels of economic development. In addition, low or negative real interest rates generally in effect in these economies also encourage excessive inventory accumulation. Finally, the system of incentives typical for centrally planned economies, which mostly relies on rewards to managers for meeting the plan targets for gross output—which can, in turn, best be insured by holding as high reserves of production inputs as possible—also encourages excessive inventory accumulation. Thus, reductions in inventories are likely to be pursued in the short run. The main problem with this strategy—without simultaneous introduction of a new economic mechanism with rewards to managers based on profit and distribution of production inputs through the market instead of government planning bureaucracy—is that excessive reliance on it can cause severe dislocations in the economy as structural bottlenecks develop when inventory levels decline below the required minimum levels based on incentive and institutional characteristics of the present economic system.

The most attractive option from a planner's point of view is to reduce the amount of unfinished construction which ties up the society's resources without any economic return. However, this is an area in which it is extremely difficult to make much progress because any results depend on enterprise cooperation for which economic incentives are generally absent. The reliance on the command mechanism can and generally does produce some results, but these are typically well below the potential gains. Nevertheless, this is one policy on which central planners repeatedly focus and uniformly advocate first during the austerity period.

Finally, central planners can curtail net new fixed capital investment. This policy is often the third one to be used following attempts to reduce inventory investment and the amount of unfinished construction. The main drawback of this policy is that it reduces future production capacity and thus also future economic growth potential. If relied upon excessively, it merely amounts to the transfer of present problems into the future with perhaps even more serious economic and political consequences. However, the myopic nature of the political process in many centrally planned economies leads to a preference on the part of present decisionmakers for "solving" lesser problems of today by creating even greater ones tomorrow—but for a new generation of politicians and planners.

Nevertheless, as in the case of collective consumption, one area where capital investment can be sharply curtailed with a beneficial effect on the economy is in the defense sector. Western analysts generally assume that the bulk of expenditures on new weapons procurements is hidden in the item "net fixed capital investment." Given the relatively large size of weapons procurement expenditures in most communist countries, the share of military investment in the total is likely to be quite large. In fact, given the suspected fairly stable nature of military investment—it is doubtful that there are extreme swings or cycles—the civilian investment is forced to fluctuate to a much greater degree if, for example, it is necessary to reduce the overall level of net investment in fixed capital. However, as in the case of material consumption of the defense sector, the option to use this policy has been closed to East European decisionmakers by the Soviets in most, if not all, instances up to this point.

## III. EMPIRICAL EVIDENCE ON MACROECONOMIC ADJUSTMENT IN EASTERN EUROPE IN 1981-82

### A. GROWTH SLOWDOWN AND DECLINE IN DOMESTIC ABSORPTION IN 1981-82

Having reviewed the policy options faced by East European planners in response to the Western and Soviet economic shocks delivered to Eastern Europe, we now turn to analyze the actual response pattern in individual East European countries observed during 1981-82. (The discussion of developments in 1983 is presented in Section V.) The summary of marcroeconomic performance and the basic pattern of adjustment—based on the official national income (net material product, or NMP) statistics—for all East European countries is presented in Table 5 below.[14] The corresponding growth statistics are also reported for the Soviet Union so that the reader may better understand the total economic environment of CMEA and also the possible reasons behind certain Soviet trade policies vis-a-vis Eastern Europe.

From Table 5, we can first see how the growth of national income produced slowed during 1981-82 in all East European economies, with the exception of East Germany in 1981. In 1981, the growth of national income produced in five East European countries fell below the average growth rate for the 1976-80 period, which itself was substantially slower than that registered during 1971-75. In 1982, further deceleration in the growth of national income produced (relative to 1981) took place in four countries—Bulgaria, Czechoslovakia, East Germany, and Hungary. The minor acceleration in growth rate registered by Romania is of little significance given the extremely poor showing of the economy by historical standards in 1981 and doubts about the reliability of post-1980 official Romanian national income statistics. Finally, the deceleration in the decline of Polish national income in 1982 was hardly something that could be considered an economic turnaround.

TABLE 5.—GROWTH OF NATIONAL INCOME PRODUCED, NATIONAL INCOME USED, AND NATIONAL INCOME ALLOCATED TO CONSUMPTION AND NET INVESTMENT DURING 1971-83

[Average annual growth in real terms in percent]

| Country | 1971-75 | 1976-80 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|
| NATIONAL INCOME (NET MATERIAL PRODUCT) PRODUCED | | | | | |
| Bulgaria | 7.8 | 6.1 | 5.0 | 4.2 | 2.9 |
| Czechoslovakia | 5.7 | 3.7 | –.1 | –.3 | 2.2 |
| East Germany | 5.4 | 4.1 | 4.8 | 2.5 | 4.4 |
| Hungary | 6.2 | 3.2 | 2.5 | 2.3 | .2 |
| Romania | 11.2 | 7.3 | 2.2 | 2.6 | 3.4 |
| CMEA Five | 6.7 | 4.6 | 2.7 | 2.1 | 2.9 |
| Poland | 9.8 | 1.2 | –12.0 | –5.5 | 4.5 |

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[14] Net material product (NMP) equals the value added of material production and certain "productive" sectors (transport, communications, trade). It roughly corresponds to the Western concept of gross national product (GNP) minus output of most services (such as housing, education, health, defense, etc.) and depreciation.

TABLE 5.—GROWTH OF NATIONAL INCOME PRODUCED, NATIONAL INCOME USED, AND NATIONAL INCOME ALLOCATED TO CONSUMPTION AND NET INVESTMENT DURING 1971–83—Continued

[Average annual growth in real terms in percent]

| Country | 1971–75 | 1976–80 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|
| Eastern Europe | 7.6 | 3.6 | −1.3 | .1 | 3.3 |
| Soviet Union | 5.6 | 4.2 | 3.3 | 4.2 | 3.6 |
| NATIONAL INCOME (NET MATERIAL PRODUCT) USED DOMESTICALLY | | | | | |
| Bulgaria | 8.6 | 2.8 | 7.7 | 1.9 | 1.5 |
| Czechoslovakia | 6.1 | 2.2 | −3.4 | −1.5 | .9 |
| East Germany | 4.7 | 3.6 | 1.3 | −3.4 | 2.8 |
| Hungary | 5.6 | 1.9 | .7 | −1.4 | −2.5 |
| Poland | 11.6 | −.2 | −10.5 | −10.5 | 3.5 |
| Romania | NA | 6.9 | −5.7 | −2.6 | −.3 |
| Soviet Union | 5.1 | 3.8 | 3.2 | 3.6 | 3.1 |
| NATIONAL INCOME USED FOR CONSUMPTION (CONSUMPTION FUND) | | | | | |
| Bulgaria | 7.0 | 4.0 | 5.3 | 3.7 | 3.8 |
| Czechoslovakia | 5.3 | 2.5 | 2.6 | −1.1 | 2.4 |
| East Germany | 5.3 | 3.8 | 2.7 | 1.2 | .8 |
| Hungary | 4.7 | 3.1 | 3.0 | 1.2 | −.2 |
| Poland | 8.7 | 4.5 | −4.6 | −11.5 | 2.1 |
| Romania | NA | 7.1 | 3.1 | −1.5 | .4 |
| Soviet Union | 5.8 | 4.7 | 4.0 | 1.2 | 2.7 |
| NATIONAL INCOME USED FOR NET INVESTMENT (ACCUMULATION FUND) | | | | | |
| Bulgaria | 12.9 | .1 | 14.8 | −3.3 | −5.2 |
| Czechoslovakia | 8.4 | 1.4 | −21.7 | −3.4 | −5.1 |
| East Germany | 2.9 | 3.0 | −3.4 | −19.9 | 11.9 |
| Hungary | 8.1 | −2.0 | −8.6 | −13.2 | −11.6 |
| Poland | 18.1 | −11.8 | −27.6 | −6.6 | 8.5 |
| Romania | NA | 6.6 | −22.1 | −5.4 | −2.1 |
| Soviet Union | 3.3 | 3.2 | .9 | 11.0 | 4.3 |

Source: 1971–82: National Statistical Yearbooks (for all countries except Romania) and unpublished official Romanian statistics. 1983: Preliminary official statistics published in 1983 plan fulfillment reports and estimates made by the Centrally Planned Economies Service of Wharton Econometrics.

With regard to the growth of national income used for domestic consumption and net investment in individual East European countries, two developments should be noted. First, with the exception of Bulgaria, which benefited from a record level of ruble trade credits granted by the Soviet Union—the Soviets registered a 678 million ruble trade surplus (based on Soviet statistics) with Bulgaria in 1981—the growth of national income used in 1981 fell below the average growth registered during the previous five-year period (1967–80). Three countries—Czechoslovakia, Poland, and Romania—registered a significant absolute decline in domestic absorption. Further deceleration in the growth of national income used took place in 1982 in three countries—Bulgaria, East Germany, and Hungary. In the remaining three countries—Czechoslovakia, Poland, and Romania—the decline in the absolute level of absorption continued, albeit at an unchanged (in Poland) or somewhat slower rate. Relative to 1980, by 1982 the largest decline in domestic absorption occurred in Poland (its national income used declined by 20% over a two-year period), followed by Romania (8.2% decline), Czechoslovakia (4.8% decline), East Germany (2.1% decline), and Hungary (0.7% decline). In marked contrast to the other

East European countries, domestic absorption in Bulgaria increased (9.7% over a two-year period).

Second, again with the exception of Bulgaria (during 1981–82), the growth of national income used was slower than the growth of national income produced in all of these countries both during 1976–80 and 1981–82. (Also in the case of Poland, in 1981 the decline in national income used was slower than the decline in national income produced.) As a result, as is shown by data in Table 6 below, the ratio of national income used for domestic consumption and net investment to national income produced steadily declined in all countries except in Bulgaria and Poland (in 1981 only). Thus, the share of national income produced devoted to a reduction of external indebtedness and/or offsetting the impact of deteriorating terms of trade steadily increased during 1981–82. Although, due to the lack of detail in official East European national income statistics, it is generally impossible to separate precisely the effect of falling trade deficits/rising trade surpluses (measured in domestic currency) on national income used from the impact of losses (due to theft, fire, floods, or earthquake) and statistical discrepancy, the rising share of these three items—foreign trade balance, losses, statistical discrepancy—in national income produced after 1980 as reported in Table 6 roughly indicates the magnitude of the impact of external shocks.

TABLE 6.—DEVELOPMENTS IN THE RELATIONSHIP BETWEEN NATIONAL INCOME PRODUCED AND NATIONAL INCOME USED FOR DOMESTIC CONSUMPTION AND INVESTMENT, 1980–83

| Country | Constant prices of year | In constant prices | | | | In current prices | | |
|---|---|---|---|---|---|---|---|---|
| | | 1980 | 1981 | 1982 | 1983 | 1980 | 1981 | 1982 |
| RATIO OF NATIONAL INCOME USED TO NATIONAL INCOME PRODUCED | | | | | | | | |
| Bulgaria | 1981 | 1.016 | 1.043 | 1.019 | 1.006 | NA | NA | NA |
| Czechoslovakia | 1977 | .969 | .937 | .925 | .913 | 0.983 | 0.964 | 0.957 |
| East Germany | 1980 | .965 | .933 | .878 | .864 | NA | NA | NA |
| Hungary | 1982 | 1.045 | 1.027 | .990 | .963 | 1.027 | 1.013 | .990 |
| Poland | 1982 | 1.019 | 1.036 | .982 | .972 | 1.031 | 1.026 | .986 |
| Romania | 1977 | .985 | .909 | .863 | .832 | 1.024 | .998 | .962 |
| Soviet Union | 1982 | .982 | .977 | .979 | .974 | .982 | .982 | .979 |
| RATIO OF SUM OF FOREIGN TRADE BALANCE, LOSSES, AND STATISTICAL DISCREPANCY TO NATIONAL INCOME PRODUCED [1] | | | | | | | | |
| Bulgaria | 1981 | −.016 | −.043 | −.019 | −.006 | NA | NA | NA |
| Czechoslovakia | 1977 | .031 | .063 | .075 | .087 | .017 | .036 | .043 |
| East Germany | 1980 | .035 | .067 | .122 | .136 | NA | NA | NA |
| Hungary | 1982 | −.045 | −.027 | .010 | .037 | −.027 | −.013 | .010 |
| Poland | 1982 | −.019 | −.036 | .008 | .028 | −.031 | −.026 | .014 |
| Romania | 1977 | .015 | .091 | .137 | .168 | −.024 | .002 | .038 |
| Soviet Union | 1982 | .018 | .023 | .021 | .026 | .018 | .018 | .021 |

[1] Calculated as 1—(national income used/national income produced).

Note.—The difference between national income produced and national income used is the sum of foreign trade balance, losses, and statistical discrepancy. Depending on the country, foreign trade balance is defined either (i) as the difference between exports and imports valued in domestic prices, or (ii) as the difference between exports and imports valued in actual transaction prices and foreign currency, which is converted into domestic currency by means of special conversion coefficients. The latter method corresponds to direct conversion of ruble trade balance and dollar trade balance into domestic currency by applying two distinct conversion coefficients to both balances. Because the excess of imports over exports increases domestic absorption relative to domestic production, trade deficit is recorded with a positive sign while trade surplus has a negative sign. National income losses arise through theft and natural disasters (fire, flooding, earthquake, etc.). Statistical discrepancy is the unexplained residual difference between national income produced and used.

Source: 1980–82: Official East European and Soviet national income statistics. 1983: Estimates prepared by the Centrally Planned Ecomomies Service of Wharton Econometrics on the basis of preliminary official statistics published in 1983 plan fulfillment reports.

### B. PROTECTION OF CONSUMPTION FROM MAJOR CUTBACKS

As outlined in Section (a), during the initial phase of macroeconomic adjustment to external shocks in 1981, East European central planners generally attempted to follow the predictable path of trying to protect consumption from cutbacks and forcing most of the adjustment on investment. In 1981, the growth of national income devoted to personal and collective consumption was still positive in all East European countries except Poland. Even in Poland, which faced an economic crisis of extraordinary proportions, official statistics indicate that the country's planners opted to reduce the level of consumption by less than 5% below the 1980 level while total domestic absorption had to be reduced by more than 10%. On the other hand, in 1981 the amount of national income allocated for net investment declined absolutely in all East European countries except Bulgaria. Cutbacks in net investment [illegible] excess of 20% took place in Poland, Romania, and Czechoslovakia, while more modest cutbacks (under 10%) took place in East Germany and Hungary. Only Bulgaria enjoyed an investment boom with 14.8% growth in net investment.

In the course of 1982, it became increasingly apparent to the central planners that the degree of protection from the required macroeconomic adjustment enjoyed by consumers in 1981 could no longer be sustained. Relative to 1981, the growth of national income allocated to consumption in 1982 declined in all East European countries. In Poland, Romania, and Czechoslovakia, the size of the consumption fund declined in absolute terms—11.5% in Poland and 1.0–1.5% in the other two countries. Very slow growth in consumption occurred in East Germany and Hungary—1.2% in both cases. However, the growth of consumption in Bulgaria—again supported by a huge Bulgarian trade deficit with the Soviet Union (597 million rubles based on Soviet data)—continued at a respectable 3.7%.

It is important to stress that the consumption growth figures reported in Table 5 include collective (social) consumption. Because the growth of collective consumption typically exceeded the growth of personal consumption in 1982—the evidence to that effect is presented in Table 8 for Czechoslovakia, Poland, and Romania—the reduction in personal consumption was significantly greater than in overall consumption. Official statistics indicate that in 1982 personal consumption fell 14.6% in Poland, 2.3% in Czechoslovakia, and 1.9% in Romania. Moreover, it is important to stress that most Western analysts are inclined to conclude that the decline in personal and overall consumption of material goods (services are excluded) reported by central statistical offices is seriously understated, mostly due to substantial understatement of consumer price inflation in individual East European countries and reduced quality of many goods (i.e., hidden price inflation). In addition, growing food and consumer goods shortages, especially in Poland and Romania, have led to a sharp increase in the scale of private barter and semi-legal and illegal retail trade transactions at prices multiple those in State stores. This element of the increase in the actual cost of living is not captured by official statistics. Finally, no statistics can capture the impact of longer lines and increasingly fruit-less searches for certain consumer goods on the welfare of a typical East European consumer.

### C. CUTBACKS IN NET INVESTMENT

Aside from the reduction in the absolute level or at least the rate of growth of consumption, in the course of 1982 East European planners continued to slash investment. This is indicated by data in Tables 5 and 7. Relative to 1980, by 1982 the level of net investment declined by 32.4% in Poland, 26.3% in Romania, 24.4% in Czechoslovakia, 22.6% in East Germany, and 20.7% in Hungary. Only in Bulgaria did net investment actually increase 11.0% during the same period. As illustrated by data in Table 7, the faster decline in net investment than in consumption led to further reduction in the share of net investment in national income in 1982, on top of the sharp decline that had already taken place in 1981. Thus, by 1982, the share of net investment in national income (based on data in constant prices) declined from 24.9% in 1980 to 19.8% for Czechoslovakia, while the corresponding decline for East Germany was from 22.7% to 18.0%, for Hungary from 24.8% to 20.1%, for Poland from 25.6% to 21.6%, and for Romania from 34.7% to 27.8%. In all cases, the share of consumption increased by a corresponding amount.

TABLE 7.—DEVELOPMENTS IN THE SHARE OF CONSUMPTION AND NET INVESTMENT IN NATIONAL INCOME USED, 1980–83

| Country | Constant prices of year | In constant prices |  |  |  | In current prices |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | 1980 | 1981 | 1982 | 1983 | 1980 | 1981 | 1982 |
| SHARE OF CONSUMPTION |  |  |  |  |  |  |  |  |
| Bulgaria | 1981 | 0.748 | 0.731 | 0.745 | 0.761 | NA | NA | NA |
| Czechoslovakia | 1977 | .751 | .798 | .802 | .814 | 0.740 | 0.799 | 0.794 |
| East Germany | 1980 | .773 | .783 | .820 | .804 | NA | NA | NA |
| Hungary | 1982 | .752 | .773 | .799 | .818 | .785 | .790 | .799 |
| Poland | 1982 | .744 | .793 | .784 | .774 | .811 | .901 | .737 |
| Romania | 1977 | .653 | .714 | .722 | .727 | .672 | .717 | .734 |
| Soviet Union | 1982 | .750 | .756 | .738 | .736 | .761 | .766 | .738 |
| SHARE OF NET INVESTMENT (ACCUMULATION) |  |  |  |  |  |  |  |  |
| Bulgaria | 1981 | 0.252 | 0.269 | 0.255 | 0.239 | NA | NA | NA |
| Czechoslovakia | 1977 | .249 | .202 | .198 | .186 | 0.260 | 0.201 | 0.206 |
| East Germany | 1980 | .227 | .217 | .180 | .196 | NA | NA | NA |
| Hungary | 1982 | .248 | .227 | .201 | .182 | .215 | .210 | .201 |
| Poland | 1982 | .256 | .207 | .216 | .226 | .189 | .099 | *.263 |
| Romania | 1977 | .347 | .286 | .278 | .273 | .328 | .283 | .266 |
| Soviet Union | 1982 | .250 | .244 | .262 | .264 | .239 | .234 | .262 |

* The large surge in the share of net investment in national income used in 1983 was due to an inventory valuation effect. Whereas the share of the increase in inventories in national income used increased from 0.007 in 1981 to 0.037 in 1982 in terms of constant prices, in terms of current prices the increase was from –0.003 (implying absolute reduction in the level of inventories) to 0.092 during the same period.

Source: 1980–82: Official East European and Soviet national income statistics. 1983: Estimates prepared by the Centrally Planned Economies Service of Wharton Econometrics on the basis of preliminary official statistics published in 1983 plan fulfillment reports.

## TABLE 8.—GROWTH OF PERSONAL AND COLLECTIVE CONSUMPTION, GROSS AND NET INVESTMENT IN FIXED CAPITAL, AND INVENTORY INVESTMENT DURING 1971-83

[Average annual growth in real terms in percent]

| Country | 1971-75 | 1976-80 | 1981 | 1982 | 1983 [1] |
|---|---|---|---|---|---|
| PERSONAL CONSUMPTION | | | | | |
| Bulgaria | 6.6 | 4.2 | 4.9 | 4.3 | 3.8 |
| Czechoslovakia | 4.8 | 1.7 | 1.7 | −2.3 | 2.0 |
| East Germany | 4.9 | 3.9 | 2.6 | 1.2 | .8 |
| Hungary | NA | NA | NA | NA | NA |
| Poland | 8.5 | 4.3 | −4.1 | −14.6 | 2.5 |
| Romania | NA | 6.9 | 3.7 | −1.9 | .5 |
| Soviet Union | NA | NA | NA | NA | NA |
| COLLECTIVE CONSUMPTION | | | | | |
| Bulgaria | NA | NA | [1] 10.5 | [1] −6.1 | 3.6 |
| Czechoslovakia | 6.8 | 4.8 | 4.9 | 1.8 | 3.3 |
| East Germany | 8.1 | 3.1 | 2.7 | 1.3 | 1.0 |
| Hungary | NA | NA | NA | NA | NA |
| Poland | 9.8 | 5.3 | −8.1 | 11.5 | 0 |
| Romania | NA | 8.4 | [1] −.5 | [1] 1.3 | 0 |
| Soviet Union | NA | NA | NA | NA | NA |
| GROSS INVESTMENT IN FIXED CAPITAL | | | | | |
| Bulgaria | 8.6 | 4.0 | 10.5 | 3.6 | 3.4 |
| Czechoslovakia | 8.2 | 3.5 | −4.6 | −2.3 | 2.2 |
| East Germany | 4.8 | 3.4 | 2.8 | −3.0 | 4.0 |
| Hungary | 7.0 | 2.4 | −5.2 | −2.2 | −5.0 |
| Poland | 17.5 | −3.0 | −22.3 | −12.2 | 4.8 |
| Romania | 11.5 | 8.5 | −7.1 | −3.1 | 2.9 |
| Soviet Union | 7.0 | 3.4 | 3.8 | 3.5 | 5.0 |
| NET INVESTMENT IN FIXED CAPITAL [2] | | | | | |
| Bulgaria | NA | NA | [1] 12.3 | [1] .4 | −.2 |
| Czechoslovakia | 9.5 | .3 | −11.1 | −11.4 | −1.5 |
| East Germany | 3.4 | [1] 2.2 | [1] .6 | [1] −9.0 | 1.9 |
| Hungary | NA | NA | [1] −16.4 | [1] −14.6 | −22.7 |
| Poland | 19.6 | −9.2 | −24.2 | −19.9 | 4.0 |
| Romania | NA | 8.4 | −13.8 | −9.6 | −.7 |
| Soviet Union | NA | NA | NA | NA | NA |
| INVENTORY INVESTMENT | | | | | |
| Bulgaria | NA | NA | [1] 12.2 | [1] −13.7 | −21.8 |
| Czechoslovakia | NA | NA | −55.3 | 47.2 | −18.6 |
| East Germany | NA | NA | [1] −28.1 | [1] −87.8 | 640.0 |
| Hungary | NA | NA | [1] 57.4 | [1] −6.9 | 30.4 |
| Poland | NA | NA | −69.5 | 400.0 | 30.3 |
| Romania | NA | NA | −77.7 | 105.1 | NA |
| Soviet Union | NA | NA | NA | NA | NA |

[1] Wharton estimate.

[2] Including investment in unfinished construction.

Source: 1971-82: National statistical yearbooks (for all countries except Romania) and unpublished official Romanian statistics. All data labelled [1] are estimates prepared by the Centrally Planned Economies Service of Wharton Econometrics. 1983: Preliminary official statistics published in 1983 plan fulfillment reports and estimates made by Wharton Econometrics.

Unfortunately, adequate data are not available to analyze the developments in the three main components of the accumulation fund—changes in new fixed capital stock, changes in unfinished construction, and changes in inventories—during 1981-82. However, some information on trends in inventories during 1981–82 is available for Czechoslovakia, Hungary, Poland, and Romania, and estimates can be made for Bulgaria and East Germany. The pattern observed in Czechoslovakia, Poland, and Romania is that following sharp reductions in inventory investment in 1981, a substantial buildup of inventories took place in 1982. This would suggest that inventory reduction is a very short-term adjustment policy and cannot be relied on excessively without causing severe supply difficulties and disruptions of production in the longer run.

Regrettably, the data on developments in unfinished construction are even scarcer than those on inventory accumulation. At this point, we cannot assess how important the reduction in unfinished construction was relative to a decline in new fixed capital as a part of the overall deflationary economic strategy. Only in the case of Czechoslovakia do we know what happened in this area in 1981–82. Following a modest reduction in the stock of unfinished construction in 1981 (i.e., disinvestment took place in that year), an offsetting increase in this stock took place in 1982. Thus between 1980 and 1982, the stock of unfinished construction stagnated at the 1980 level. This was a significant achievement, since during 1976–80, an average of 3.8% of national income used was spent on increases in unfinished construction on an annual basis. In contrast to Czechoslovakia, the share of national income used spent on increases in unfinished construction in Hungary (based on data in current prices) increased from 0.8% in 1980 to 1.5% in 1981 and 3.0% in 1982. With regard to other East European countries (notably Poland and Romania), casual evidence and the emphasis on the reduction in the stock of unfinished investment projects during 1981–82 in speeches by decisionmakers and in newspaper and journal articles seem to indicate that a reduction in unfinished construction contributed significantly to reducing the amount of national income devoted to net investment.

## IV. UNDERSTATEMENT OF THE ADJUSTMENT IN CONSUMPTION AND NET INVESTMENT BY OFFICIAL STATISTICS

### A. UNDERSTATEMENT OF CUTBACKS IN NET INVESTMENT

There are three reasons why we should expect that the deceleration in growth/reduction in the level of consumption and net investment implied by official East European statistics have been seriously understated. First, inadequate depreciation rates applied in these economies tend to imply higher increases in net fixed capital stock than economically justified. Second, without analyzing the developments in material consumption and net investment by the defense sector, the changes in collective non-defense consumption and net civilian investment cannot be adequately understood. Third, as has already been mentioned, underestimation of actual inflation probably leads to an upward bias in official growth figures for national income and its components or an underestimation of the decline in these aggregates when central planners impose severe austerity measures.

With regard to the first factor, as is well known, depreciation rates applied in the CPEs are unrealistically low. Whereas, depending on the type, machinery and equipment is typically depreciated in the West over a period of three to ten years, in the CPEs the corresponding depreciation rates range between about eight and thirty years. Similarly, structures are depreciated in the West over a period of fifteen to twenty-five years but in the CPEs the depreciation runs fifty years or even longer. Thus, it is clear that accounting depreciation rates in the CPEs run well below reasonable economic depreciation rates. Since by definition net investment in fixed capital stock equals gross investment minus depreciation, an understatement of actual economic depreciation implies an overstatement of net investment.[15]

Moreover, when gross investment declines sharply—such as in all East European countries during 1981-82 (except in Bulgaria in 1981)—the impact of the understatement of depreciation is to greatly understate the decline in net investment.[16] Thus, we have solid grounds to conclude that the reduction in net investment in fixed capital reported in Table 8 and, consequently, also the reduction in the proportion of national income allocated for net investment (accumulation fund) have been significantly understated in official statistics. Therefore, the degree of reliance by central planners on reduction in net investment, as opposed to reduction in consumption during a period of austerity when overall domestic absorption was to be reduced, has probably been much greater than official statistics would lead us to believe.

As far as the second factor is concerned, it has been pointed out in Section II that collective consumption figures are generally believed to include material consumption of the defense sector, while the data on net investment in fixed capital stock include net investment in military hardware by the defense sector. As can be expected, no official data on either component of defense spending are available. Therefore, in assessing the recent developments in the burden of defense expenditure on East European economies, we have to rely on indirect indicators—such as trends in the level of official defense budget vis-a-vis total government budget, net material product used, or GNP (based on Western estimates). While these measures are not particularly satisfactory proxies for the

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[15] This can be illustrated by means of the following example:

| | Year t | Year t+1 | Percent growth |
|---|---|---|---|
| Capital stock: | | | |
| Official figure | 1,000 | 1,050.0 | 5.0 |
| Realistic figure | 1,000 | 1,025.0 | 2.5 |
| Gross investment | 100 | 80.0 | −20.0 |
| Depreciation: | | | |
| Official figure (5 percent) | 50 | 52.5 | 5.0 |
| Realistic figure (7.5 percent) | 75 | 77.0 | 2.5 |
| Net investment: | | | |
| Official figure | 50 | 27.5 | −45.0 |
| Realistic figure | 25 | 3.0 | −88.0 |

As the above example indicates, an understatement of economic depreciation by one-third due to applying 5 percent depreciation rate instead of 7.5 percent reduced net investment by one-half. Moreover, a 20 percent downturn in gross investment in year t+1 results in 88 percent reduction in realistically calculated net investment while the official methodology would imply a reduction of only 45 percent.

[16] This is in fact illustrated by means of an example in footnote 15 above.

burden of defense, primarily because Western defense analysts generally conclude that a considerable share of actual defense spending (primarily in the R&D area) is not accounted for in the official defense budget figures, hopefully they still have some meaning.

The data in Table 9 below generally seem to indicate the rising burden of defense expenditure in Eastern Europe during 1981–82, except in the case of Hungary and Romania. Since it can be reasonably assumed that the dominant portion of East European defense budgets involves acquisition of military hardware, especially in view of low accounting labor cost of the army because of negligible pay to draftees, and since it does not appear that a decline in gross investment by the defense sector took place at least in four countries—Bulgaria, Czechoslovakia, East Germany, and Poland—we are inclined to conclude that net investment by the defense sector in these countries either did not declined significantly or may have even increased during 1981–82. If, in fact, this conclusion is correct, the sharp reduction in overall net investment coupled with stagnant or even rising net military investment implies an even greater drop in net civilian investment. Combined with the impact of understated depreciation, it would seem that the actual decline in net civilian investment was far in excess of the drop implied by the official net overall investment figures. In addition, for similar reasons, the reduction in the growth/level of consumption may be understated because collective material consumption by the defense sector in some countries did not suffer the kind of setback observed for personal and civil collective consumption.

TABLE 9.—CHANGES IN THE RELATIVE DEFENSE BURDEN IN EASTERN EUROPE, 1980–82

[In percent]

| Country | 1980 | 1981 | 1982 |
|---|---|---|---|
| A—DEFENSE EXPENDITURE AS SHARE OF GOVERNMENT BUDGET (calculated from data in current prices) | | | |
| Bulgaria | 6.6 | 6.0 | NA |
| Czechoslovakia [1] | 7.5 | 7.4 | 7.8 |
| East Germany | 6.2 | 6.4 | 6.4 |
| Hungary | 3.9 | 4.0 | 4.1 |
| Poland | 5.3 | 5.2 | 7.2 |
| Romania | 3.5 | 3.9 | NA |
| B—DEFENSE EXPENDITURE AS SHARE OF NET MATERIAL PRODUCT USED (calculated from data in current prices) | | | |
| Bulgaria | 4.0 | 4.0 | 4.1 |
| Czechoslovakia [1] | 4.8 | 5.1 | 5.2 |
| East Germany | 5.5 | 5.7 | 6.1 |
| Hungary | 3.0 | 3.0 | 3.0 |
| Poland | 3.2 | 3.5 | 3.7 |
| Romania | 2.0 | 2.0 | 1.8 |
| C—DEFENSE EXPENDITURE AS SHARE OF GNP IN DOMESTIC CURRENCY (calculated from data in current prices estimated by Alton et al.) | | | |
| Bulgaria | 3.2 | 3.2 | 3.2 |
| Czechoslovakia | 3.3 | 3.5 | 3.5 |
| East Germany | 3.9 | 4.1 | 4.2 |
| Hungary | 2.3 | 2.3 | 2.2 |
| Poland | 2.9 | 3.1 | 4.0 |
| Romania | 1.7 | 1.6 | 1.4 |

TABLE 9.—CHANGES IN THE RELATIVE DEFENSE BURDEN IN EASTERN EUROPE, 1980–82—Continued

[In percent]

| Country | 1980 | 1981 | 1982 |
|---|---|---|---|
| D—DEFENSE EXPENDITURE AS SHARE OF GNP IN DOLLARS (calculated from data in current prices estimated by Alton et al.) | | | |
| Bulgaria | 9.3 | 9.2 | 10.1 |
| Czechoslovakia | 4.8 | 5.0 | 5.2 |
| East Germany | 5.4 | 5.5 | 5.8 |
| Hungary | 4.5 | 4.5 | 4.5 |
| Poland | 5.3 | 5.6 | 7.0 |
| Romania | 4.3 | 4.2 | 4.6 |

[1] Including government expenditure on police/security services.

Source: Tables A and B: based on official East European statistices of defense expenditure, government budget (including budgets of regional authorities in the case of Czechoslovakia), and net material product used; tables C and D: taken from Thad P. Alton et al., "East European Defense Expenditures, 1965–1982", in this volume.

One interesting area for analysis is the differences in response to growing economic difficulties with regard to adjusting defense budgets in the individual East European countries. During 1981-82, the defense burden appears to have declined only in Romania, it remained unchanged in Hungary, increased modestly in Bulgaria, and grew significantly in the remaining three countries—Czechoslovakia, East Germany, and Poland. Romania is politically the most independent member of the Warsaw Pact and the strongest advocate of control of arms spending. Given its economic difficulties—after Poland the second most serious within CMEA—and the absence of significant economic aid from the Soviet Union, its political leadership was compelled to cut defense spending and probably did not pay much heed to Soviet wishes. Hungary and Bulgaria are two countries which are currently most reform-minded in Eastern European and probably pay closer attention to the cost of their military establishments than the other countries. Their political leaders are probably more inclined to offer only lukewarm support to Soviet pressure for increased military spending in response to growing "aggressiveness on the part of NATO in general and the U.S. in particular." The political leaders of Czechoslovakia and East Germany are most dependent on Soviet support and hence more responsive to Soviet pressure—however, recent events indicate that even in their case, there is a limit.[17] Finally, in the case of Poland, the fact that the army is the ruling force in the country at present, the unresolved domestic political situation, and continued specter of violent clashes with the population, help to explain why the military's claim on a shrinking resource pie was given top priority. Although Polish defense spending must have declined in real terms during 1981-82, the reduction was probably well below that suffered by consumers and the rest of the civilian economy.

### B. UNDERSTATEMENT OF ADJUSTMENTS IN CONSUMPTION

Finally, the adjustment in personal consumption, social consumption, and net investment during 1981-83 may be understated because of underestimation of actual inflation. The factors that may be responsible for this include:

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[17] We are referring to the hesitant attitude of Czechoslovakia and East German political leadership with respect to stationing additional Soviet nuclear missiles on their territories in late 1983 and early 1984.

(i) Official price indices may not be representative of the actual typical basket of goods consumed by households (i.e., they may include items which are no longer typical for a given class of goods):[18]

(ii) The nature of goods represented in the official price index may change in the direction of reducing quality in order to maintain fixed price;[19]

(iii) No account is taken of price developments in the second economy (private markets) though their relative importance has markedly risen in some countries, notably Poland, in recent years;

(iv) Price stability is achieved through hidden inflation—such as when the quality of inputs used to produce certain goods in reduced (e.g., by substituting inferior raw materials of domestic origin for imported raw materials) without corresponding downward adjustment in product price;

(v) Price increases are hidden by introducing "new" higher-priced goods embodying mostly cosmetic changes—in this case, the quality is maintained or even improved, but the increase in price is disproportionate (the way "new" goods are introduced in the price index, they cannot push up the overall price level in the year in which they are introduced): [20]

(vi) Availability of lower-priced items within each class of goods is reduced, effectively pushing up average transactional prices without increasing specific nominal posted prices (this does not affect official estimates of inflation but it boosts actual inflation by either forcing buyers to offer bribes for increasingly scarce items or to incur the additional transaction cost of obtaining those goods by allocating more time for search, queuing, etc.; alternatively, this results in the so-called "forced substitution" of higher priced items for cheaper items formerly consumed); [21]

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[18] For example, the average cost of a pack of cigarettes has risen significantly in Eastern Europe over the past decade. This was mainly a result of substitution of fancier brands and higher priced cigarettes (Western brands produced under license, brands imported from Bulgaria and Yugoslavia, and domestic brands in improved packaging). However, the prices of cheapest domestic brands of cigarettes generally were not changed or increased only modestly and these brands are included in the price index. The fact that fewer individuals smoke these brands makes them less representative and understates the actual increase in average cost of all cigarettes.

[19] For example, the nature of "man's pair of shoes" or "man's suit" may change by increasing the contents of cheaper sythetic materials (rubber, plastic, polyester) and reducing that of natural materials (leather, wool). The average price may remain unchanged, but the quality of the product is no longer the same.

[20] At the earliest, new goods are introduced into the price index only in the second year of production. Thus the high introductory price of a new consumer good item has no effect on the price index. If, in fact, its price is reduced stays unchanged during the second year, no inflation will be registered.

[21] Forced substitution occurs when a monopolist reduces or eliminates availability of a certain product and introduces higher priced products that are unnecessarily fancy or complicated because their production is more profitable. Faced with lack of substitutes, the consumer ends up buying the higher priced product. In technical terms, the monopolist (state enterprise) forces the consumer off his/her demand curve and expropriates a portion of the so-called consumer surplus. An example of this is a situation when ordinary iron nails disappear from the market and only galvanized nails are available. Somebody building a house needs nails and iron nails are all that he/she needs for the job. However, faced with the specter of construction delay, the consumer ends up buying galvanized nails—perhaps at twice the cost of iron nails—thereby signifi-

Continued

(vii) Transfer of certain goods previously available in regular stores to higher-class specialty stores where they are sold for higher prices (it appears that prices in these stores are generally not reflected in the official retail price index); [22]

(viii) Outright falsification of some statistics by the authorities in order to hide particularly embarrassing information regarding a suspected decline in living standards (for example, recent official Romanian consumption statistics probably fall in this category.[23]

Concentrating on the developments in consumer prices, in Table 10 we present official retail trade price statistics for 1971–83 for all goods as well as those for food and non-food items. These statistics indicate that until 1981 only Hungary and Poland registered significant open retail trade price inflation (except during 1976–80 when there are significant price increases in Bulgaria as well). In 1982, Hungary and Poland were joined by Czechoslovakia and Romania. In 1983, major price increases are known to have occurred in Bulgaria. This leaves East Germany as the only East European country which continues to claim no inflation for at least the last twenty-five years. With the exception of Poland since 1981 and Romania in 1982, the officially reported retail trade price increases still appear quite modest by Western standards. However, in view of the impact of the above factors, these increases may not in fact have been nearly as modest as reported officially.

TABLE 10.—DEVELOPMENTS IN RETAIL TRADE PRICES, 1971–83

[Average annual growth in percent]

| Country | 1971–75 | 1976–80 | 1961 | 1982 | 1983 |
|---|---|---|---|---|---|
| All items: [1] | | | | | |
| Bulgaria | 0.2 | 4.0 | 0.5 | 0.2 | NA |
| Czechoslovakia | .1 | 2.1 | .8 | 5.7 | .9 |
| East Germany | –.3 | .1 | .2 | 0 | 0 |
| Hungary | 3.0 | 7.1 | 5.0 | 6.6 | 7.2 |
| Poland | 2.5 | 6.8 | 21.2 | 101.0 | 25 |
| Romania | .5 | 1.4 | 2.0 | 16.0 | 5–7 |
| Soviet Union | –.1 | .7 | 1.4 | 3.4 | NA |
| Food: [2] | | | | | |
| Bulgaria | .6 | 6.2 | .3 | .2 | NA |
| Czechoslovakia | –.1 | 1.2 | 0 | 10.6 | .3 |
| East Germany | .2 | 0 | 0 | 0 | 0 |
| Hungary | 2.2 | 7.3 | 3.1 | 8.2 | 5.6 |
| Poland | 2.9 | 7.5 | 30.3 | 125.0 | 26 |
| Romania | 1.1 | 1.0 | 1.7 | NA | NA |
| Soviet Union | .3 | .4 | 1.9 | 3.8 | NA |

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cantly increasingly the construction cost. Yet the official price index will show no inflation because the price of galvanized nails was not changed. The fact that consumers were forced to double their outlay on nails is not accounted for and the substitution is thus treated in official statistics as a voluntary one.

[22] For example, certain types of food—such as high grades of beef like fillet mignon—are generally not available in regular butcher stores in Eastern Europe. However, they may be readily available in specialty-delicatessen stores in "oven-ready" form at substantially marked-up prices. To our knowledge, prices charged by these stores are not reflected in official retail prices indices.

[23] It is very difficult to believe that the reduction in consumption and net investment in Romania in 1981-82 was roughly of the same magnitude as in Czechoslovakia. Intuitively, given the depth of Romanian economic difficulties and drastic cutbacks in hard-currency imports, the reduction in domestic absorption should have been, let us say, half-way between Czechoslovakia and Poland. However, this would imply a cutback in consumption of at least 10% between 1980 and 1982.

TABLE 10.—DEVELOPMENTS IN RETAIL TRADE PRICES, 1971–83—Continued

[Average annual growth in percent]

| Country | 1971–75 | 1976–80 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|
| Nonfood items: [3] | | | | | |
| Bulgaria | −.1 | 2.4 | .7 | .1 | NA |
| Czechoslovakia | .2 | 2.8 | 1.5 | 1.5 | 1.5 |
| East Germany | −1.0 | .2 | .5 | 0 | 0 |
| Hungary | 3.7 | 6.9 | 6.6 | 5.5 | 8.8 |
| Poland [4] | 2.5 | 6.5 | 13.1 | 85.0 | 19 |
| Romania | −.3 | .6 | 2.3 | NA | NA |
| Soviet Union | −.3 | .8 | 1.6 | 2.3 | NA |

[1] In most cases including services.

[2] In most cases including prepared food in restaruants and enterprise cafeterias. Alcohol is included in this category (even in the case of Poland).

[3] In most cases, this item does not include services. It covers primarily prices of industrial consumer goods.

[4] Excluding both services and nonconsumption goods.

Source: 1980–82: Official East European and Soviet statistics. 1983: Estimates prepared by the Centrally Planned Economies Service of Wharton Econometrics on the basis of preliminary official statisticas published in 1983 plan fulfillment reports and other official East European statistical sources.

Regrettably, as yet, we do not have an adequate measure of hidden inflation in the CPEs short of trying to construct our own price indices and comparing them with the official indices.[24] On the other hand, ample personal contacts with East European consumers offering endless examples of inflationary incidents lead most Western analysts to suspect steady hidden inflation in recent years, in the 1–5% range per year, depending on the country. This inflation comes on top of the officially reported inflation.

In general, the informal consensus of experts appears to be that official inflation statistics are most reliable for Hungary, followed by Czechoslovakia, East Germany, Bulgaria, Poland, and Romania. Thus, the pattern of hidden inflation should also roughly follow this ranking—with least hidden inflation for Hungary and most for Poland and Romania. In the case of Poland, footnotes and remarks in official publications warn nowadays of the limited reliability of the official inflation estimates because of large volume of retail transactions outside the state sector (at prices several times those in state-run retail stores), significantly reduced quality of many goods, and severely limited availability of most goods at officially posted nominal prices. One can then hardly escape the conclusion that official Polish claims of a mere 18% decline in personal consumption between 1980 and 1982 and only 2% decline in personal consumption in Romania in 1982 are far from reality. In general, "intuitive" analysis would lead us to conclude that already in 1981 personal consumption stagnated in Czechoslovakia, Hungary, and Romania and by 1982 it fell sharply in all East European countries except Bulgaria (it may possibly have stagnated in East Germany). The decline in personal consumption in Poland between 1980 and 1982 was more likely somewhere between 25% and 30%, while the decline in Romania was at least in the 10–15% range.[25]

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[24] One way of detecting hidden inflation would be to make benchmark purchasing power parity comparisons of East European currencies vis-a-vis a major Western currency, such as the DM, and then calculate the implicit East European inflation rates given the known West German inflation between the two benchmark years.

[25] See footnote 23 above.

## V. GROWTH RECOVERY OF EAST EUROPEAN ECONOMIES IN 1983

Following two years of economic stagnation—aggregate East European national income produced declined 1.3% in 1981 and increased a mere 0.1% in 1982—there was a significant growth recovery in Eastern Europe in 1983 with combined East European national income produced rising an estimated 3.3%. According to official statistics, economic growth accelerated in Czechoslovakia, East Germany, Poland, and Romania, while growth decelerated in Bulgaria and Hungary. Growth deceleration in the latter two countries was mostly due to poor agricultural due to drought. In addition, in the case of Hungary, the decline in the growth of national income produced also reflected delayed adjustment necessitated by the hard-currency balance-of-payments pressures. The key factor in the aggregate East European growth turnaround was the beginning of the Polish economic recovery; the 4.5% growth of its national income produced in 1983 was in sharp contrast with 12.0% decline in 1981 and an additional 5.5% decline in 1982.

The acceleration in the growth of aggregate output of material goods and "productive" services in 1983 generally permitted increases in domestic absorption as well. Whereas in 1982 domestic absorption declined in absolute terms in all East European countries except Bulgaria, four countries—Bulgaria, Czechoslovakia, East Germany, and Poland—appear to have experienced an increase in national income used domestically last year. For Romania, the offical figures imply a small decline in domestic absorption in 1983, but at a rate well below that observed in 1981–82. Only in Hungary the decline in domestic absorption accelerated, reflecting delayed implementation of macroeconomic adjustment measures relative to the rest of Eastern Europe.

Although in general domestic absorption increased in Eastern Europe in 1983 relative to 1982, its growth in all countries fell short of the growth of national income produced. In four East European countries the real level of domestic absorption in 1983 was still below the 1980 level—by about 17% in Poland, 8–9% in Romania, 4% in Czechoslovakia, and 3% in Hungary. In contrast, the level of domestic absorption in East Germany in 1983 was about the same as in 1980 (the increase was under 1%) and in Bulgaria it increased by 11–12% over the three-year period, mostly thanks to continued Soviet generosity with respect to granting ruble trade loans to Bulgaria and permitting large-scale re-export of Soviet oil by Bulgaria for hard currency in order to generate steady hard-currency trade surpluses. The comparatively slower increase in domestic absorption relative to aggregate production in 1983 was necessitated by the requirement to generate hard-currency trade and balance-of-payments surpluses comparable to those earned in 1982 and to offset further deterioration in terms of trade with the Soviet Union of at least 4%. As is indicated by the data in Table 6, based on national income statistics in constant prices, the estimated share of national income produced allocated to servicing hard-currency debt and offsetting deterioration in terms of trade with the Soviet Union increased in all East European countries in 1983.

The improved availability of goods in 1983 on the whole tended to benefit consumers. Based on preliminary estimates, national income allocated to consumption increased in all countries except in Hungary; the growth of consumption accelerated in Czechoslovakia, Poland, and Romania, decelerated in East Germany and Hungary, and probably remained unchanged in Bugaria. In contrast, net investment continued to decline in all but two countries—East Germany and Poland. However, the sharp increase in net investment in 1983—estimated at close to 12% in East Germany and 8-9% in Poland—was probably due to rebuilding of depleted inventories rather than to acceleration in net investment in fixed capital. This conclusion follows from the fact that the officially reported figures on the growth of gross investment—about 4.0% in East Germany and 4.8% in Poland—were too low to imply a significant upturn in net fixed capital investment. (According to our estimates, net investment in fixed capital increased around 2% in East Germany and 4% in Poland.) On the whole, the above conclusions imply that East European planners were pressed by political considerations to mortgage the future of these economies by protecting current consumption and sacrificing modernization and upgrading of the industrial base, and hence the future competitiveness and growth potential of these economies.

## VI. Implications for the Future

### A. FUTURE IMPLICATIONS OF RECENT INVESTMENT CUTBACKS

The macroeconomic adjustments that East European planners made in response to the Western credit squeeze and deteriorating terms of trade with the Soviet Union during 1981-83 appear to have been guided by their overwhelming concern for social stability. Even in 1982-83, they were attempting to minimize the impact of their deflationary policies on consumption and standards of living. There is no doubt that they were influenced by the example of social unrest in Poland, which was in part set off by the attempt of the country's political leadership to bring population income and consumption into line with production.

As a result, the cutbacks in investment have had to be severe in most cases. While this policy may have only mild repercussions on economic growth in the short run, it is likely to create problems for the future. Already most of the East European countries are lagging behind other countries, both in the industrialized West and increasingly also in some parts of the Third World, in the introduction of new equipment and technologies. Thus, the impact of reduced investment at this time will not be limited only to a slowdown in production, but to a deterioration in their competitiveness in the world market for manufactured products. Recent East European macroeconomic adjustment policies are thus mortgaging the future of these economies.

The important point to be made is that contrary to general impression among Western specialists monitoring East European economies, the present East European rates of net capital formation are relatively low. Although the share of net investment in national income used appear rather high by standards of most Western economies—for example, in 1983, the shares of net investment in individual East European countries ranged between 18% and

27%—this impression is quite misleading for a number of reasons. First of all, the comparison of net investment to the Western concept of net national product (NNP, or GNP minus depreciation) instead of net material product (NMP) would reduce the above shares by three to five percentage points as NNP levels tend to exceed NMP levels by 20–30% due to the exclusion of output of most services in the latter concept of national income.[26] In addition, the share of net investment would be reduced by another one to two percentage points if net investment is related to NNP produced—as is done in the West—instead of NNP domestically used. Secondly, further downward adjustment in East European net investment rates would result from removing net investment in military hardware as was discussed in Section IVa. Thirdly, the introduction of meaningful depreciation rates would push up the level of aggregate depreciation charges and further reduce the share of net investment in aggregate net output.

The forth and final point to be raised regards the composition of net investment in Eastern Europe. There are systemic reasons which lead managers in these economies to overinvest in inventory accumulation and unfinished construction. The former occurs because of the absence of the profit motive, absence of positive real interest rates, and tying most of the managerial and labor incentives to the fulfillment of gross output targets. A sure way of fulfilling those targets, irrespective of the cost, is to maintain excessive inventories of material inputs as "insurance" against non-delivery of inputs by suppliers. The latter occurs due to the investment psychology prevailing in these economies, i.e., the best way for the managers to insure the commitment of investment resources and ultimate completion of the project is to get it started and then plead with planners to allocate the necessary resources to complete it on the basis that a great deal has already been commited and leaving the project unfinished is wasteful. The absence of positive real interest rates and standard cost-benefit calculation in making investment decisions provides further encouragement to maintain large amount of unfinished investment.

As a result of the above disincentives to allocate investment resources in an economic fashion, in contrast to Western market economies, the centrally planned economies of Eastern Europe tend to underinvesting finished capital goods/projects and overinvest in inventories and unfinished capital goods/projects. Naturally, a sensible way of dealing with the problem would be to restructure investment patterns away from inventory investment and starting new investment projects towards completing investment projects already in progress while maintaining the overall investment levels unchanged. However, this is virtually impossible to do without fundamental economic reforms based on the introduction of the profit motive, realistic pricing of resources, introduction of meaningful interest rates, etc. Therefore, in order to achieve the rates of finished fixed capital formation required for fundamental restructuring and modernization of East European economies to make them more competitive on the world market, at this point it is necessary to boost investment rates and reduce the growth of consumption.

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[26] The difference between NNP and NMP is that the latter does not inlcude most services, such as housing, health, education, defense, etc. On the other hand, some services are included in NMP—transport and communications (by now most countries include both passenger and freight transport and personal and business communications in NMP), and trade (retail, wholesale, and foreign trade).

The unwillingness of the East European political leadership, with the notable exception of that in Hungary, to permit fundamental economic reforms over the past three years presents an increasing dilemma for these economies—a "Catch-22" situation. it dooms East Europe to growing relative technological backwardness and declining competitiveness on the world market because political considerations do not permit further reduction in the level or the growth of living standards, and low growth rates of output necessitate even slower growth of net capital formation. Although it may still be possible to achieve a fundamental restructuring and modernization of these economies with the present rates of net capital formation, this would require major changes in the investment patterns and a significant increase in the efficiency of investment, namely increasing the rates of investment in finished capital goods/projects and sharply reducing unfinished investment and inventory investment. But such change in investment patterns cannot be achieved without fundamental changes in economic environment and incentives and unavoidable associated political consequences, which are unacceptable to the present East European political leadership.

### B. ABSENCE OF RELIEF FROM EXTERNAL SOURCES

Moreover, it currently appears unlikely that relief will be forthcoming shortly from external sources, either in the form of increased Western credits or additional economic asssitance from the Soviets. Although the balance-of-payments adjustments that have been made in Eastern Europe are impressive, and should help to rebuild confidence among Western lenders that centrally planned economies are especially capable of making dramatic economic adjustments when necessary, it will take a considerable amount of time for perceptions to change. In addition, the general outlook for international financing continues to be quite bleak at this time because of the continued debt crisis in the Third World. It is also unlikely that the Soviets will be able to do much more for Eastern Europe since they are currently facing a sharp deterioration in their own terms of trade with the West due to continued decline in relative prices of oil and gas vis-a-vis manufactured goods. Moreover, the slow growth of the Soviet economy since 1979—averaging 3.3% annually compared to 5.4% annual growth of NMP produced during 1971–78—also raises doubts about Soviet willingness to "finance" East European economic recovery. If, in fact, the Soviet trade policies vis-a-vis Eastern Europe during 1981–83 (outlined in section Ie) are an indicator of the new trend, then Eastern Europe should be on the lookout for posible additional shocks rather than relief from the Eastern direction.

### C. FUTURE IMPLICATIONS OF THE LACK OF REFORMS

On the other hand, it is still possible that the partial success of the East European planners in reducing levels/growth rates of real consumption by the population in 1982-83 without setting off large-scale social unrest may whet the appetite of the political leaders to apply more similar "medicine" in upcoming years. It seems that the fear of "Polish-type" reaction to attempted reduction/growth slowdown in population living standards—prevalent in 1981 and still strong in 1982—is wearing off. At the same time, the danger of serious political miscalculation is steadily rising. The initial success in adjustment of living standards in the case of Eastern Europe is a poor predictor of what may happen as the politicians move closer to testing the threshold of population's patience. But the temptation may well be present and it should not be surprising if planners in some of the East European economies (other than Hungary) attempt to "finance" the restructuring and modernization of these economies through further relative belt-tightening on the part of the population instead of relying on increased efficiency of investment resulting from introduction of economic reforms.

In fact, the particularly disturbing developing is that after three years of unprecedented economic difficulties only two East European economies are currently responding to these difficulties with another round of substantive reforms—Hungary and, to a lesser degree, Bulgaria. Polish and Romanian reforms have not really gotten off the ground because of severe economic difficulties, which reinforced the tendency on the part of decisionmakers to rely on highly centralized crisis management, and certain political difficulties (notably in Poland, due to numerous unresolved major political issues). Minor institutional and incentive changes in East Germany and Czechoslovakia, which are not even permitted to be called "reforms," do not represent a significant departure from past economic policies. Thus, in four our of six East European economies the political leadership has opted for a "muddling through" strategy of handling the present economic difficulties. The seeming success of this strategy, which brought growth recovery in 1983, may tempt them to stay with it in 1984 and beyond.

In all fairness to central planners, improved economic performance in Eastern Europe need not result solely from the introduction of economic reforms but could also be achieved by improving the system of planning and organization of these economies. This is, in fact, the direction followed by East German planners with some apparent success. However, most Western and East European economists remain very skeptical about the transferability of East German economic policies and planning techniques to the rest of Eastern Europe—at least relative to transferability of Hungarian-type reforms. Simply stated, the cultural and ethnic factors are important in considering imitations of East German economic system and the work ethic and discipline still present in East Germany is absent elsewhere. Improved labor morale and discipline in most of Eastern Europe can probably be secured only through improved financial incentives or Stalinist-type labor policies—the latter hardly a choice any sane East European leader, it is hoped, would contemplate.

East European political leaders and central planners are making a serious mistake if they end up confusing the growth recovery in 1983 with a return to the growth path of at least the second half of the 1970s. The 1983 growth recovery was natural given the depressed state of most of these economies in 1981-82. However, even sustaining the 1983 growth performance in 1984 may prove quite difficult. The road to faster growth depends on the ability of East European economies to increase their efficiency—particularly with respect to the use of increasingly scarce imports of energy and raw materials—and relative competitiveness of their manufactured products in quality and price terms on the world market. With the possible exception of East Germany, such improvement in efficiency can come only from fundamental reforms of East European economies, such as the introduction of rational price structure, tying incentives to profitability of production, increasing competition, and reducing the stranglehold of centralized planning. By postponing the inevitable again, some East European countries are running the risk of settling to a low-growth plateau for a number of years, which has been the Soviet problem since 1979. The difference is that for Eastern Europe this slow-growth plateau would probably be well below 3% annual growth experienced by the Soviets—most likely in the 1.5-2.5% range—because Eastern Europe does not have the natural resource base the Soviets do, a large portion of which is yet to be exploited. The sooner the East European decisionmakers awaken to this reality, the better off the economies of Eastern Europe are likely to be in the second half of 1980s and beyond.

## APPENDIX—A NOTE ON NATIONAL INCOME ACCOUNTING IN EAST EUROPEAN COUNTRIES

In Section II above, it was stated that the East European need to earn substantial hard-currency trade surpluses and the impact of deteriorating terms of trade with the Soviet Union reinforce each other in requiring a reduction in national income used for domestic consumption and investment relative to national income produced. This means that either the growth of the former has to fall below the growth of the latter or domestic absorption has to fall absolutely.

In order to understand this argument, it is useful to briefly review the East European national income accounting procedures. Rather than using Western accounting methodology for national income based on GNP, the East European countries employ methodology based on net material product accounting. Net material product roughly corresponds to GNP minus net output (valued added) of "non-productive" services (housing, defense, health, education, etc.) and depreciation.

According to the East European methodology, national income used for consumption (personal and collective) and investment equals national income produced minus losses in the economy (due to natural and other disasters, theft, etc.) plus the excess of imports of material goods over exports. If exports exceed imports, then the trade balance is subtracted from the national income produced in order to arrive at the national income used.

Two somewhat different methodologies are used by individual CMEA countries to include the trade balance in national accounts. With the Soviet methodology, the trade balance is calculated as the difference between domestic acquisition value of exports and the value of domestic sales of imports. Under the other methodology, which is used, for example, by Czechoslovakia, the difference between exports and imports measured in foreign transaction prices is converted into domestic currency by means of specially computed exchange rates, which relate the relationship between the average internal and external price level. (It should be noted that the internal price structure of East European economies, except for Hungary and increasingly also Romania in 1981–82, is usually quite different from the prevailing world market relative price structure. Thus, foreign trade accounting in external and internal prices produces rather different pictures.)

Assuming an unchanged level and structure of domestic prices, a decline in hard-currency trade deficit or an increase in hard-currency trade surplus results in a decline in national income used for consumption and net investment relative to national income produced. In growth terms, the growth of national income used must fall below that of national income produced.

A deterioration in the country's terms of trade has a similar effect. Given unchanged domestic prices and deteriorating external terms of trade, a larger amount of exports will be required to pay for the same amount of imported goods. Thus, in terms of domestic prices, a deterioration in the terms of trade will appear as an increase in trade surplus or a decline in trade deficit. (This conclusion is based on the assumption that no change takes place in the external trade balance measured in actual transactional prices.) Hence the effect of the deterioration in the country's terms of trade is to further reduce the amount of national income usable for consumption and net investment relative to national income produced.

# POLICY RESPONSES TO EXTERNAL SHOCKS IN HUNGARY AND YUGOSLAVIA: 1974-76 AND 1979-81

By Bela Balassa and Laura Tyson*

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## INTRODUCTION

In this paper, the authors examine the experiences of Hungary and Yugoslavia with external shocks during the 1974-76 and the 1979-81 periods. In both periods, oil prices were substantially increased, resulting in the deterioration of the terms of trade of oil-importing countries. At the same time, in conjunction with the ensuing world recessions, the growth of international trade decelerated.

This paper follows an earlier study by the authors on policy responses to external shocks in Hungary and Yugoslavia during the

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1974–78 period. The earlier study also made comparisons with outward-oriented and inward-oriented newly industrializing countries, for which estimates for the more recent period were not yet available.[1] In the present paper, the experience of the first three years of the 1974–78 period and of the three years 1979–81 are compared in the two countries.

The methodology used is identical to that employed in the earlier study. It has involved estimating the balance-of-payments effects of external shocks, resulting from the deterioration of the terms of trade and the slowdown of foreign demand for exports, as well as the effects of policy responses to these shocks, including reliance on additional net external financing, output-increasing policies of export promotion and import substitution, and restrictive macroeconomic policies. As in the earlier study, estimates of these effects have been made for Hungary's and Yugoslavia's trade with private market and socialist economies, taken separately as well as together.

The balance-of-payment effects of external shocks have been derived by postulating a situation that would have existed in the absence of external shocks. Terms-of-trade effects have been obtained as the difference between the current price values of exports and imports and their constant price values, estimated in the prices of the relevant base period. In the estimates "1972" (the average from the years 1971 to 1973) is the base year for calculations pertaining to the 1974–76 period and "1977" (the average for the years 1976 to 1978) for calculations pertaining to the 1979–81 period. Terms-of-trade effects have further been decomposed into a "pure terms-of-trade effect," calculated on the assumption that the balance of trade expressed in base year prices was in equilibrium, and an "unbalanced trade effect," indicating the impact of the rise of import prices on the deficit (surplus) in the balance of trade, expresed in base year prices.

The balance-of-payments effects of the slowdown of foreign demand on the exports of the countries studied, or export volume effects, have been calculated as the difference between the trend value of exports and hypothetical exports.[2] The trend value of exports has been derived on the assumptions that the growth rate of foreign demand for individual export products and product groups remained the same as in the 1963-73 period and that the particular country maintained its base year market share in these exports. In turn, hypothetical exports have been estimated on the assumption that the country maintained its base year market share in the actual exports of individual products and product groups during the period under consideration.[3]

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[1] Bela Balassa and Laura Tyson, "Adjustment to External Shocks in Socialist and Private Market Economies," invited paper prepared for the 7th World Congress of the International Economic Association on Structural Change, Economic Interdependence, and World Development held in Madrid, Spain in September 1983; to be published in the proceedings of the Congress. World Bank Development Research Department Discussion Paper No. 61, November 1983.

[2] Current price data on trade with private market economies and on Yugoslavia's trade with socialist countries originate in the GATT trade tapes. Constant price data have been derived by using unit value indices published by the Food and Agriculture Organization for traditional primary exports, taken individually, in the case of Yugoslavia; the lack of detailed information on trade flows has not permitted separating traditional from nontraditional primary exports in Hungary. In turn, unit value indices published by the United Nations have been utilized for the exports of nontraditional primary products, fuels, and manufactured goods. Finally, the country's own import price indices have been employed for its total imports and the U.N. index for its imports of fuels.

Hungary's trade with the socialist countries is expressed in terms of rubles, and the estimates made in rubles have been converted into U.S. dollars by utilizing the forint/ruble exchange rate derived as a ratio of Hungary's balance of trade published in terms of forints and in terms of rubles in the Külkereskedelmi Evkönyv (Foreign Trade Yearbook), 1980. We are indebted to Jan Vaňous of Wharton Econometric Forecasting Associates, who supplied the estimates of Hungary's trade with socialist countries and of CMEA exports and imports, all expressed in terms of rubles as well as the unit value indices for this trade.

In the present study, the balance-of-payments effects of increases in interest rates in the 1979-81 period have also been estimated. These effects have been derived as the difference between actual net interest payments and the payments that would have been made if interest rates remained at "1977" levels.[4]

The balance-of-payments effects of policy responses to external shocks have also been estimated by hypothesizing a situation that would have occurred in the absence of external shocks. Additional net external financing has been derived as the difference between the actual merchandise trade balance and the trade balance that would have been obtained if trends in imports and exports observed in the 1963-73 period continued and the prices of exports and imports remained at their base year level. The effects of export promotion have been calculated as changes in exports resulting from changes in the country's base year export market shares. Import substitution has been defined as savings in imports associated with a decrease in the income elasticity of import demand as compared to the 1963-73 period, with separate estimates made for fuel and nonfuel imports. Finally, the effects on imports of changes in GNP growth rates in response to macroeconomic policies have been calculated on the assumption that the income elasticities of import demand remained at 1963-73 levels.[5]

## I. BALANCE-OF-PAYMENTS EFFECTS OF EXTERNAL SHOCKS, 1974-76 AND 1979-81

Table 1 provides estimates of the balance-of-payments effects of external shocks for Hungary and Yugoslavia. Separate estimates are presented for trade with private market economies, trade with socialist economies, and aggregate or total trade. Table 2 relates the estimates to the relevant value of trade and the value of GNP, measured in base year prices. The results pertain to the years 1974–76 and 1979–81 and are shown for individual years and as period averages.

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[3] In trade with private market economies, trend and hypothethical values of exports have been calculated with respect to the world exports of traditional export products, defined as primary products that accounted for at least 1.5 percent of total exports in base period prices, and with respect to the developing countries' exports of fuels, nontraditional primary products other than fuels, and manufactured goods. The view underlying the calculations is that each country competes against all suppliers in the world market for its traditional exports while its nontraditional exports compete against those of the developing countries.

In turn, in Hungary's and Yugoslavia's trade with socialist countries, trend and hypothetical values of exports have been calculated with respect to the imports of socialist countries from CMEA member countries. The view underlying the calculations is that in their export trade with socialist economies Hungary and Yugoslavia compete with CMEA suppliers.

[4] The calculation has been made by utilizing London Euro-dollar rates. These rates averaged 6.77 percent in "1977"; they were 11.96 percent in 1979, 14.36 percent in 1980, and 16.51 percent in 1981 (International Monetary Fund, International Financial Statistics Yearbook, 1982, p. 56). Adjusting for inflation rates does not modify the results as unit values for the manufactured exports of the developed countries, which can be considered an appropriate deflator, increased at the same rate (7.6 percent a year) between "1977" and 1981 as between 1975 and 1978 (United Nations Monthly Bulletin of Statistics, various issues).

[5] For more detail on the procedures used in calculating the balance-of-payments effects of external shocks and of policy responses to these see Bela Balassa "The Newly-Industrializing Developing Countries after the Oil Crisis," Weltwirtschaftliches Archiv, vol. 117, no. 1 (1981), pp. 142-94.

## TABLE 1.—BALANCE-OF-PAYMENTS EFFECTS OF EXTERNAL SHOCKS AND OF POLICY RESPONSES TO THESE SHOCKS

[In millions of dollars]

| | Hungary | | | | | | | | Yugoslavia | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 |
| TRADE WITH MARKET COUNTRIES | | | | | | | | | | | | | | | | |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects | 458 | 570 | 334 | 454 | −2 | −4 | −105 | −37 | 1,554 | 1,815 | 1,265 | 1,545 | 1,404 | 2,253 | 2,956 | 2,204 |
| Pure | 284 | 440 | 191 | 305 | −133 | −217 | −358 | −236 | 162 | 433 | 398 | 331 | 19 | 419 | 1,288 | 575 |
| Unbalanced | 175 | 130 | 143 | 149 | 131 | 213 | 254 | 199 | 1,392 | 1,382 | 867 | 1,214 | 1,385 | 1,834 | 1,668 | 1,629 |
| Export volume effects | 21 | 165 | 77 | 87 | 130 | 314 | 477 | 307 | 28 | 261 | 110 | 133 | 109 | 260 | 455 | 275 |
| Together, excluding interest rate effects | 479 | 735 | 411 | 542 | 129 | 309 | 372 | 270 | 1,582 | 2,076 | 1,375 | 1,678 | 1,513 | 2,513 | 3,411 | 2,479 |
| Interest rate effects | 0 | 0 | 0 | 0 | 159 | 216 | 650 | 342 | 0 | 0 | 0 | 0 | 261 | 672 | 2,057 | 997 |
| Total | 479 | 735 | 411 | 542 | 287 | 525 | 1,022 | 612 | 1,582 | 2,076 | 1,375 | 1,678 | 1,774 | 3,185 | 5,468 | 3,476 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing | 618 | 678 | 525 | 607 | −43 | 87 | 781 | 275 | 2,039 | 1,891 | 430 | 1,454 | 2,886 | 2,218 | 2,806 | 2,637 |
| Additional net external financing excluding interest rate effect | 618 | 678 | 525 | 607 | −202 | −129 | 131 | −67 | −2,039 | 1,891 | 430 | 1,454 | 2,625 | 1,546 | 749 | 1,640 |
| Increase in export market shares | −149 | −132 | −285 | −189 | −56 | −177 | −511 | −248 | −437 | −302 | −372 | −370 | −349 | −383 | −128 | −286 |
| Import substitution | 20 | 206 | 140 | 122 | 219 | 182 | 123 | 174 | 225 | 422 | 1,174 | 607 | −845 | 715 | 1,516 | 462 |
| Effects of lower GNP growth rate | −11 | −16 | 31 | 1 | 167 | 434 | 630 | 411 | −245 | 64 | 144 | −12 | 81 | 635 | 1,274 | 663 |
| Together, excluding interest rate effect | 479 | 735 | 411 | 542 | 128 | 309 | 372 | 270 | 1,582 | 2,076 | 1,375 | 1,678 | 1,513 | 2,513 | 3,411 | 2,479 |
| TRADE WITH SOCIALIST COUNTRIES | | | | | | | | | | | | | | | | |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects | −17 | 104 | 155 | 81 | 187 | 146 | 8 | 114 | 159 | 59 | 111 | 110 | 230 | 241 | −6 | 155 |
| Pure | −2 | 120 | 265 | 128 | 207 | 212 | 174 | 198 | 155 | 116 | 95 | 122 | 56 | 163 | 308 | 179 |
| Unbalanced | −15 | −16 | −110 | −47 | −20 | −66 | −166 | −84 | 4 | −57 | 16 | −12 | 164 | 78 | −313 | −24 |
| Export volume effects | 9 | 100 | 159 | 89 | 491 | 934 | 1,304 | 910 | −9 | 47 | 86 | 41 | 275 | 577 | 802 | 551 |
| Together, excluding interest rate effects | −7 | 204 | 314 | 170 | 678 | 1,081 | 1,312 | 1,024 | 150 | 106 | 197 | 151 | 505 | 818 | 796 | 706 |
| Interest rate effects | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | −7 | 204 | 314 | 170 | 678 | 1,081 | 1,312 | 1,024 | 150 | 106 | 197 | 151 | 505 | 818 | 796 | 706 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing | −5 | 201 | 78 | 91 | 174 | 37 | −258 | −15 | 80 | −104 | 53 | 10 | 337 | −118 | −989 | −257 |

## TABLE 1.—BALANCE-OF-PAYMENTS EFFECTS OF EXTERNAL SHOCKS AND OF POLICY RESPONSES TO THESE SHOCKS—Continued

[In millions of dollars]

| | Hungary | | | | | | | | Yugoslavia | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 |
| **TRADE WITH SOCIALIST COUNTRIES—Continued** | | | | | | | | | | | | | | | | |
| Additional net external financing excluding interest rate effect | –5 | 201 | 78 | 91 | 174 | 37 | –258 | –15 | 80 | –104 | 53 | 10 | 337 | –118 | –989 | –257 |
| Increase in export market shares | –24 | 26 | 176 | 59 | 268 | 290 | 368 | 309 | 59 | 135 | 103 | 99 | –81 | 602 | 1,137 | 552 |
| Import substitution | 38 | 9 | 40 | 29 | 48 | 233 | 449 | 243 | 75 | 59 | 5 | 46 | 220 | 118 | 219 | 186 |
| Effects of lower GNP growth rate | –17 | –32 | 21 | –9 | 188 | 521 | 752 | 487 | –64 | 16 | 36 | –4 | 29 | 216 | 429 | 225 |
| Together, excluding interest rate effect | –7 | 204 | 314 | 170 | 678 | 1,081 | 1,312 | 1,024 | 150 | 106 | 197 | 151 | 505 | 818 | 796 | 706 |
| **TOTAL TRADE** | | | | | | | | | | | | | | | | |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects | 441 | 674 | 489 | 535 | 185 | 142 | –97 | 77 | 1,713 | 1,874 | 1,376 | 1,655 | 1,634 | 2,494 | 2,950 | 2,359 |
| Pure | 282 | 560 | 456 | 433 | 74 | –5 | –184 | –38 | 317 | 549 | 493 | 453 | 85 | 582 | 1,596 | 754 |
| Unbalanced | 160 | 114 | 33 | 102 | 111 | 147 | 88 | 115 | 1,396 | 1,325 | 883 | 1,202 | 1,549 | 1,912 | 1,355 | 1,605 |
| Export volume effects | 30 | 265 | 236 | 176 | 621 | 1,248 | 1,781 | 1,217 | 19 | 308 | 196 | 174 | 384 | 837 | 1,257 | 826 |
| Together, excluding interest rate effects | 472 | 939 | 725 | 712 | 807 | 1,390 | 1,684 | 1,294 | 1,732 | 2,182 | 1,572 | 1,829 | 2,018 | 3,331 | 4,207 | 3,185 |
| Interest rate effects | 0 | 0 | 0 | 0 | 159 | 216 | 650 | 342 | 0 | 0 | 0 | 0 | 261 | 672 | 2,057 | 997 |
| Total | 472 | 939 | 725 | 712 | 648 | 1,174 | 1,034 | 952 | 1,732 | 2,182 | 1,572 | 1,829 | 2,279 | 4,003 | 6,264 | 4,182 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing | 613 | 879 | 603 | 698 | 131 | 124 | 523 | 260 | 2,119 | 1,788 | 483 | 1,463 | 3,223 | 2,100 | 1,817 | 2,380 |
| Additional net external financing excluding interest rate effect | 613 | 879 | 603 | 698 | –28 | –92 | –127 | –82 | 2,119 | 1,788 | 483 | 1,463 | 2,962 | 1,428 | –240 | 1,383 |
| Increase in export market shares | –173 | –106 | –109 | –130 | 212 | 113 | –143 | 61 | –378 | –167 | –269 | –271 | –430 | 219 | 1,009 | 266 |
| Import substitution | 58 | 215 | 180 | 151 | 267 | 415 | 572 | 417 | 300 | 481 | 1,178 | 653 | –624 | 833 | 1,735 | 648 |
| Effects of lower GNP growth rate | –28 | –48 | 52 | –8 | 355 | 955 | 1,382 | 898 | –309 | 80 | 180 | –16 | 110 | 851 | 1,703 | 888 |
| Together, excluding interest rate effect | 472 | 939 | 725 | 712 | 806 | 1,390 | 1,684 | 1,294 | 1,732 | 2,182 | 1,572 | 1,829 | 2,018 | 3,331 | 4,207 | 3,185 |

Source: World Bank economic and social data bank and text.

# TABLE 2.—BALANCE-OF-PAYMENTS EFFECTS OF EXTERNAL SHOCKS AND OF POLICY RESPONSES TO THESE SHOCKS

[Amounts in percent]

| | Hungary | | | | | | | | Yugoslavia | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 |
| **TRADE WITH MARKET ECONOMIES** | | | | | | | | | | | | | | | | |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects/average trade | 34.7 | 44.1 | 23.7 | 32.9 | −0.1 | −0.1 | −3.2 | −1.1 | 64.3 | 75.9 | 54.4 | 65.0 | 24.6 | 43.7 | 57.7 | 41.4 |
| Terms-of-trade effects/GNP | 5.6 | 6.5 | 3.7 | 5.2 | −.0 | −.0 | −.6 | −.2 | 5.3 | 6.2 | 4.1 | 5.2 | 2.6 | 4.2 | 5.4 | 4.1 |
| Export volume effects/exports | 1.7 | 13.5 | 5.8 | 7.0 | 4.5 | 10.7 | 16.9 | 10.7 | 2.0 | 17.7 | 6.2 | 8.6 | 3.4 | 7.6 | 11.5 | 7.8 |
| Export volume effects/GNP | .3 | 1.9 | .8 | 1.0 | .8 | 2.0 | 3.0 | 1.9 | .1 | 0.9 | .4 | .4 | .2 | .5 | 0.8 | .6 |
| External shocks/GNP | 5.8 | 8.4 | 4.5 | 6.3 | .8 | 2.0 | 2.3 | 1.7 | 5.4 | 7.1 | 4.4 | 5.6 | 2.9 | 4.7 | 6.2 | 4.6 |
| Interest rate effects/GNP | 0 | 0 | 0 | 0 | 1.0 | 1.4 | 4.0 | 2.1 | 0 | 0 | 0 | 0 | .5 | 1.2 | 3.7 | 1.8 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing/average trade | 46.8 | 52.4 | 37.2 | 45.2 | −6.4 | −4.0 | 4.0 | −2.1 | 84.4 | 79.1 | 18.5 | 61.1 | 46.0 | 30.0 | 14.6 | 30.8 |
| Additional net external financing/GNP | 7.5 | 7.8 | 5.8 | 7.0 | −1.3 | −.8 | 0.8 | −.4 | 7.0 | 6.4 | 1.4 | 4.9 | 5.0 | 2.9 | 1.4 | 3.0 |
| Increase in export market shares/exports | −12.3 | −10.8 | −21.6 | −15.1 | −2.0 | −6.1 | −18.1 | −8.6 | −32.0 | −20.4 | −20.8 | −24.0 | −10.9 | −11.2 | −3.2 | −8.1 |
| Import substitution/imports | 1.4 | 15.1 | 9.3 | 8.5 | 6.4 | 5.2 | 3.3 | 4.9 | 6.5 | 12.8 | 41.0 | 18.9 | −10.3 | 10.4 | 24.1 | 6.5 |
| Effects of lower GNP growth rate/imports | −.7 | −1.2 | 2.0 | .1 | 4.9 | 12.4 | 17.1 | 11.6 | −7.1 | 1.9 | 5.0 | −.4 | 1.0 | 9.2 | 20.3 | 9.3 |
| **TRADE WITH SOCIALIST COUNTRIES** | | | | | | | | | | | | | | | | |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects/average trade | −1.1 | 6.2 | 8.5 | 4.8 | 4.7 | 3.8 | 0.2 | 2.9 | 14.8 | 5.1 | 9.1 | 9.6 | 9.3 | 8.3 | −.2 | 5.5 |
| Terms-of-trade effects/GNP | −.2 | 1.2 | 1.7 | .9 | 1.2 | .9 | 0.0 | .7 | .5 | .2 | .4 | .4 | .4 | .4 | .0 | .3 |
| Export volume effects/exports | .6 | 6.0 | 8.3 | 5.0 | 12.3 | 23.8 | 32.2 | 22.8 | −.9 | 4.0 | 7.1 | 3.6 | 12.5 | 20.5 | 23.7 | 19.6 |
| Export volume effects/GNP | .1 | 1.1 | 1.8 | 1.0 | 3.1 | 5.9 | 8.1 | 5.7 | .0 | .2 | .3 | .1 | .5 | 1.1 | 1.5 | 1.0 |
| External shocks/GNP | −.1 | 2.3 | 3.5 | 2.0 | 4.3 | 6.9 | 8.1 | 6.5 | .5 | .4 | .6 | .5 | 1.0 | 1.5 | 1.4 | 1.3 |
| Interest rate effects/GNP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing/average trade | −.3 | 12.0 | 4.3 | 5.4 | 4.4 | 1.0 | −6.7 | −.4 | 7.4 | −9.1 | 4.4 | .9 | 13.5 | −4.1 | 31.3 | −9.0 |
| Additional net external financing/GNP | −.1 | 2.3 | .9 | 1.1 | 1.1 | .2 | −1.6 | −.1 | .3 | −.4 | .2 | .0 | .6 | −.2 | −1.8 | −.5 |
| Increase in export market shares/exports | −1.5 | 1.6 | 9.2 | 3.1 | 6.7 | 7.4 | 9.1 | 7.7 | 5.5 | 11.4 | 8.5 | 8.6 | −3.7 | 21.4 | 33.6 | 19.6 |
| Import substitution/imports | 2.5 | 0.5 | 2.3 | 1.8 | 1.2 | 6.3 | 12.3 | 6.6 | 6.9 | 5.3 | .4 | 4.0 | 7.9 | 4.1 | 6.9 | 6.4 |
| Effects of lower GNP growth rate/imports | −1.1 | −1.9 | 1.2 | −.6 | 4.8 | 14.0 | 20.6 | 13.1 | −6.0 | 1.5 | 2.9 | −.4 | 1.1 | 7.3 | 14.6 | 7.8 |

## TABLE 2.—BALANCE-OF-PAYMENTS EFFECTS OF EXTERNAL SHOCKS AND OF POLICY RESPONSES TO THESE SHOCKS—Continued

[Amounts in percent]

| | TOTAL TRADE | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hungary | | | | | | | | Yugoslavia | | | | | | | |
| | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 | 1974 | 1975 | 1976 | Average 1974–76 | 1979 | 1980 | 1981 | Average 1979–81 |
| I. EXTERNAL SHOCKS | | | | | | | | | | | | | | | | |
| Terms-of-trade effects/average trade | 15.5 | 22.7 | 15.1 | 17.7 | 2.6 | 2.0 | −1.4 | 1.1 | 49.1 | 53.0 | 38.8 | 46.9 | 19.9 | 31.0 | 35.6 | 28.9 |
| Terms-of-trade effects/GNP | 5.4 | 7.7 | 5.4 | 6.2 | 1.2 | .9 | −0.6 | .5 | 5.9 | 6.4 | 4.4 | 5.5 | 3.1 | 4.6 | 5.4 | 4.4 |
| Export volume effects/exports | 1.1 | 9.2 | 7.3 | 5.9 | 9.0 | 18.2 | 25.9 | 17.7 | .7 | 11.6 | 6.6 | 6.5 | 7.1 | 13.4 | 18.5 | 13.1 |
| Export volume effects/GNP | .4 | 3.0 | 2.6 | 2.0 | 4.0 | 7.9 | 11.0 | 7.7 | .1 | 1.0 | .6 | 6 | .7 | 1.6 | 2.3 | 1.5 |
| External shocks/GNP | 5.7 | 10.8 | 8.0 | 8.2 | 5.1 | 8.9 | 10.4 | 8.2 | 5.9 | 7.4 | 5.1 | 6.1 | 3.9 | 6.2 | 7.6 | 5.9 |
| Interest rate effects/GNP | 0 | 0 | 0 | 0 | 1.0 | 1.4 | 4.0 | 2.1 | 0 | 0 | 0 | 0 | .5 | 1.2 | 3.7 | 1.8 |
| II. POLICY RESPONSES | | | | | | | | | | | | | | | | |
| Additional net external financing/average trade | 21.5 | 29.7 | 18.6 | 23.1 | −.4 | −1.3 | −1.8 | −1.2 | 60.7 | 50.6 | 13.6 | 41.5 | 36.2 | 17.8 | −2.9 | 16.9 |
| Additional net external financing/GNP | 7.5 | 10.1 | 6.7 | 8.1 | −.2 | −.6 | −0.8 | −.5 | 7.2 | 6.1 | 1.6 | 4.9 | 5.5 | 2.6 | −.4 | 2.6 |
| Increase in export market shares/exports | −6.2 | −3.7 | −3.4 | −4.4 | 3.1 | 1.6 | −2.1 | 0.9 | −15.5 | −6.3 | −8.9 | −10.0 | −8.0 | 3.5 | 13.7 | 4.2 |
| Import substitution/imports | 2.0 | 7.1 | 5.6 | 4.9 | 3.6 | 5.7 | 7.8 | 5.7 | 6.6 | 10.9 | 28.8 | 15.0 | −5.7 | 8.5 | 18.8 | 6.5 |
| Effects of lower GNP growth rate/imports | −1.0 | −1.6 | 1.6 | −.3 | 4.8 | 13.2 | 18.3 | 12.3 | −6.8 | 1.8 | 4.4 | −.4 | 1.0 | 8.7 | 18.5 | 8.9 |

Source: See table 1.

In interpreting the results, it should be noted that for Hungary private market economies accounted for 40 percent of exports and 49 percent of imports in 1974-76 and for 43 percent of exports and 48 percent of imports in 1979-81. The comparable figures were higher, 56 percent and 74 percent in 1974-76 and 55 percent and 71 percent in 1979-81 for Yugoslavia.[6] There were also differences in the modus operandi of trade with socialist economies in the two countries. Hungary is a member of the Council for Mutual Economic Assistance (CMEA) and carries out the bulk of its trade with the other CMEA countries in the framework of long-term bilateral trade agreements. These agreements regulate the quantities traded as well as their prices, which generally follow world market prices with a lag. Yugoslavia is not a member of CMEA, and its trade with socialist economies is generally conducted at world market prices and is denominated in dollars. Nonetheless, Yugoslavia carries out a substantial but variable portion of this trade on a dollar denominated clearing basis, so that net export earnings are not available to cover convertible currency deficits with private market economies.[7]

Differences in prices obtained in the two markets (at least in the Hungarian case) raise questions about the aggregation of trade with private market and with socialist economies. Furthermore, it is widely believed that many of Hungary's and some of Yugoslavia's exports to socialist economies are not easily saleable in private market economies. A similar observation applies to imports from private economies, for which there are limited substitution possibilities from socialist economies. Finally, neither Hungary's earnings of non-convertible rubles nor Yugoslavia's dollar earnings on a clearing basis with socialist economies can be used to finance imports from private market economies or to service convertible currency debt.

Nonetheless, trade flows with the two groups of countries are interrelated as imports from one group often serve as inputs into exports to the other. Also, the diversion of imports and exports from one group of countries to the other is possible for a wide variety of goods. Thus, products sold in private market economies find markets in socialist countries and the reverse is true for raw materials and fuels. Finally, both Hungary and Yugoslavia earn convertible currencies on a certain portion of their trade with socialist economies that can be used for import purchase or debt servicing in convertible currencies.

Consequently, the aggregation of results is necessary in order to obtain an overall assessment of the effects of external shocks and policy responses to these shocks. The results of the aggregation should be treated cautiously, however, and greater weight should be given to the separate results for each trading area.

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[6] These ratios should be interpreted only as rough approximations, particularly for Hungary, because the prices used in calculating trade flows with socialist countries are not directly comparable with the prices used in calculating trade flows with private market economies.

[7] Yugoslavia only recently began to publish trade statistics on a clearing and non-clearing basis; the figures show that, on the average, about 80 percent of Yugoslavia's trade with socialist economies was on a clearing basis between 1980 and 1982. Comparable figures for earlier periods are not available. In general, the share of clearing in Yugoslavia's socialist trade depends on the importance of the Soviet Union, East Germany, and Czechoslovakia in this trade, since Yugoslavia's trade with these three countries is conducted on a clearing basis. In 1974-76 the three countries accounted for 75 percent of Yugoslavia's socialist trade; in 1979-81 for 81 percent.

### *A. Terms-of-trade effects*

In trade with private market economies, Hungary suffered adverse terms-of-trade effects equivalent to 34 percent of the average value of this trade in the 1974–76 period while in the 1979–81 period such effects were practically non-existent. These results are explained by the fact that the prices of foodstuffs, exported by Hungary to private market economies, increased relatively little compared to the prices of manufactured goods, in which Hungary had a large trade deficit vis-a-vis private market economies, in the first period while these prices rose approximately in unison in the second. At the same time, Hungary was not significantly affected by increases in world oil prices in its trade with private market economies, because the overwhelming share of its oil imports came from socialist economies, in particular, the Soviet Union.

The adverse terms-of-trade effects were much smaller in Hungary's trade with socialist economies than in its trade with private market economies during the first period, amounting to only 5 percent of the average value of the former. To a considerable extent, this is the consequence of the lagged reaction of intra-CMEA oil prices to changes in world oil prices. This lagged adjustment also explains the continued increase of the terms-of-trade effects in socialist trade between 1976 and 1978.[8]

During the 1979–81 period, terms-of-trade effects in socialist trade were smaller in Hungary than during the 1974–76 period, amounting to only about 3 percent of the value of this trade. Once again, this relatively small size of these effects is the consequence of the lagged adjustment of intra-CMEA oil prices, and a deterioration of the terms-of-trade is expected in subsequent years as these prices continue to catch up to world oil prices. Taken together, aggregate terms-of-trade effects amounted to 18 percent of the average value of Hungary's total trade during the 1974–76 period and to a mere one percent during the 1979–81 period.

Yugoslavia experienced a considerable deterioration of its terms of trade vis-a-vis private market economies in 1974–76 (65 percent of the average value of trade) as well as in 1979–81 (41 percent) and a much smaller terms-of-trade loss vis-a-vis socialist economies (10 percent and 6 percent). The differences in the results are largely explained by the fact that Yugoslavia imports the bulk of its oil from private market economies. At the same time, with private market economies accounting for a larger proportion of total trade in Yugoslavia than in Hungary, its aggregate terms-of-trade loss, expressed as a proportion of total trade (47 percent in 1974–76 and 29 percent in 1979–81), exceeded that of Hungary.

In the 1974–76 period, the higher ratio of terms-of-trade losses to total trade was offset by the lower share of trade in the gross national product in Yugoslavia compared with Hungary, so that terms-of-trade losses equalled 6 percent of GNP in both countries.

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[8] Balassa and Tyson, op. cit. Table 1.

In the 1979–81 period, the ratios were 4 percent and 1 percent in Hungary and Yugoslavia, respectively.[9]

*B. Export volume effects*

In trade with private market economies, Hungary suffered export shortfalls amounting to 7 percent of export value in 1974–76 and 11 percent in 1979–81. The comparable figures in trade with socialist economies were smaller, 5 percent in the first and 23 percent in the second period. Finally, the average ratios for Hungary's total trade were 6 percent in 1974–76 and 18 percent in 1979–81.

In Yugoslavia, the adverse export volume effects accounted for 9 percent of export value in trade with private market economies, 4 percent of export value in trade with socialist countries, and 7 percent of export value in total trade for the 1974–76 period. The corresponding ratios were 8 percent, 20 percent and 13 percent for the 1979–81 period.

For both countries, then, export-volume effects were larger in trade with private market economies than with socialist economies in the first period while the opposite was the case during the second. These results reflect changes in trends in imports by private market economies and socialist economies. During the first period, the growth of imports declined to a considerable extent in private market economies owing to the recession of 1974–75 while the growth of imports declined only slightly in socialist economies as economic conditions remained buoyant with only temporary interruptions. During the second period, import growth fell more substantially in socialist economies that could not maintain earlier growth rates supported by foreign borrowing.

In 1974–76, Hungary experienced somewhat smaller export shortfalls than Yugoslavia in trade with private market economies. The results reflect the higher share of manufactured goods in Hungary's total exports and the fact that demand for manufactured goods declined less than demand for other goods in private market economies during the period. The opposite conclusion applies to the 1979–81 period when export shortfalls were larger in Hungary than in Yugoslavia. In turn, export shortfalls in trade with socialist economies were somewhat larger in Hungary than in Yugoslavia in both periods. Finally, aggregate export effects were larger relative to GNP in Hungary than in Yugoslavia reflecting the higher share of exports in GNP in the former. Total export volume effects amounted to 2 percent of GNP in 1974–76 and 8 percent of GNP in

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[9] The calculations have been made by postulating that export and import prices would have remained unchanged in the absence of external shocks. In making adjustment for the effects of trade imbalances measured in base year prices, one may further indicate the magnitude of pure terms-of-trade effects. While Yugoslavia traditionally had a large deficit in merchandise trade, financed to a greater or a lesser extent by earnings from tourism and workers remittances, Hungary had a small deficit in 1974–76 and a slight surplus in 1979–81. Correspondingly, pure terms-of-trade effects accounted for only 27 percent of Yugoslavia's terms-of-trade loss in 1974–76 and 32 percent in 1979–81 while in Hungary the ratio was 81 percent in 1974–76 and pure terms-of-trade effects showed a small gain in 1979–81. These figures refer to the total trade of the two countries. With its deficit concentrated in trade with private market economies, pure terms-of-trade effects accounted for an even smaller share of Yugoslavia's terms-of-trade losses vis-a-vis these economies while its pure terms-of-trade effects exceeded its overall terms-of-trade effects vis-a-vis socialist economies. Similar conclusions apply to Hungary, except that during the 1979–81 period Hungary actually registered a substantial pure terms-of-trade gain in trade with private market economies.

1979-81 in Hungary, compared with 1 percent of GNP in 1974-76 and 2 percent of GNP in 1979-81 in Yugoslavia.

### *C. Interest rate effects*

As noted earlier, interest rate effects have been estimated for the years 1979 to 1981, when large increases in interest rates occurred in world financial markets. These effects averaged 2 percent of GNP in both Hungary and Yugoslavia during the period. In interpreting the figures, it should be emphasized, however, that they reflect not only increases in interest rates but also the high rate of borrowing by the two countries in previous years, which raised the amount of outstanding loans to which higher interest charges were applied.

### *D. External shocks combined*

The ratio of the balance-of-payments effects of external shocks to Hungary's GNP was 6 percent in trade with private market economies and 2 percent in trade with socialist economies in the years 1974-76. With changes in the opposite direction occurring in subsequent years, these ratios were 2 percent and 7 percent in 1979-81, exclusive of interest rate effects. The corresponding figures for Yugoslavia were 6 percent and 1 percent in 1974-76 and 5 percent and 1 percent in 1979-81.

It appears, then, that in Hungary compensating changes occurred between 1974-76 and 1979-81 as far as external shocks in trade with private market economies and with socialist countries are concerned, so that the overall magnitude of external shocks underwent little change. The latter conclusion applies to Yugoslavia also, but external shocks in trade with private market economies continued to exceed those in trade with socialist countries several times.

At the same time, terms-of-trade effects declined, and export volume effects increased, between 1974-76 and 1979-81 in Hungary as well as in Yugoslavia. However, terms-of-trade effects had greater importance in Yugoslavia than in Hungary in 1974-76 and this difference was further accentuated in 1979-81. As a result, during the second period, export volume effects came to exceed adverse terms-of-trade effects several times in Hungary while the latter continued to dominate the former in Yugoslavia.

Finally, reflecting the greater openness of its economy, the adverse balance-of-payments effects of external shocks remained larger relative to GNP in Hungary than in Yugoslavia. This conclusion is not affected if allowance is made for interest rate effects, which had a similar incidence in the two countries during the 1979-81 period.

## II. THE BALANCE-OF-PAYMENTS EFFECTS OF THE POLICIES APPLIED, 1974-76 AND 1979-81

Estimates of the balance-of-payments effects of policy responses to external shocks in the trade of Hungary and Yugoslavia with private market and socialist economies are reported in Table 1 for the years 1974-76 and 1979-81. In turn, Table 2 relates the results to the value of trade and to GNP in the two countries. The discussion will proceed, first, by considering the general character of adjustment in the 1974–76 and the 1979–81 periods and, second, by examining the individual forms of adjustment.

### *A. The character of the adjustment*

Additional net external financing was the dominant policy response in both Hungary and Yugoslavia in the 1974–76 period, offsetting almost entirely the adverse balance-of-payments effects of external shocks in total trade in the first case and four-fifths of these effects in the second. Additional net external financing was concentrated in trade with private market economies, exceeding the balance-of-payments effects of external shocks in Hungary and approaching them in Yugoslavia. In contrast, additional net external financing equalled one-half of the balance-of-payments effects of external shocks in trade with socialist economies in Hungary and only a negligible proportion in Yugoslavia. In the Hungarian case, the additional financing was mainly applied by the Soviet Union which allowed Hungary, like the other members of the CMEA, to run a ruble trade deficit to ease the impact of rising fuel prices. The Soviet Union did not accord similar preferential treatment to Yugoslavia.

In the aggregate, import substitution offset one-fifth of the balance-of-payments effects of external shocks in Hungary and one-third of these effects in Yugoslavia during the 1974–76 period. In Hungary, the ratio was one-fourth in trade with private market economies and one-sixth in trade with socialist economies; in Yugoslavia, there was little difference between the two groups of countries.

Both countries lost export market shares in their total trade in 1974–76, with these losses increasing the balance-of-payments effects of external shocks by slightly about one-sixth in the two cases. Losses in export market shares were concentrated in trade with private market economies while both countries increased their shares in the markets of socialist economies.

Apart from a short interlude in 1976, neither of the two countries applied restrictive macroeconomic policies in response to the external shocks they suffered in the mid-seventies. With the net effects of import substitution and export promotion being relatively small, this policy choice necessitated reliance on external financing and gave rise to rapid increases in the external indebtedness of both countries.

Restrictive policies were applied in Hungary as well as in Yugoslavia in response to the external shocks of the 1979–81 period, when the possibilities for further borrowing were greatly limited. The resulting import savings offset over two-thirds of the balance-of-payments effects of external shocks in Hungary and over one-fourth in Yugoslavia. Import savings due to restrictive macroeconomic policies accounted for a larger proportion of the balance-of-payments effects of external shocks in trade with private market economies than in trade with socialist economies in Hungary; these proportions were approximately equal in Yugoslavia.

In the 1979–81 period, import substitution was more important in Hungary than it had been earlier, thereby adding to import savings. During this period, Hungary also realized a slight overall gain in export market shares, although it continued to lose market shares in trade with private market economies. As a result of these developments, additional net external financing turned negative in Hungary, irrespective of whether one considers trade with private market or socialist economies.

In contrast to Hungary, import substitution was less important in Yugoslavia during the 1979-81 period than it had been earlier. Like Hungary, however, Yugoslavia realized a net gain in export market shares, attributable to a large gain in its share in socialist markets that more than offset its continued losses in private markets. In conjunction with these developments and the import savings associated with the imposition of restrictive policies in 1980, Yugoslavia reduced its reliance on additional net external financing, although it still offset over two-fifths of the balance-of-payments effects of external shocks through such financing. Foreign borrowing was concentrated in private market economies, with net external financing being negative in trade with socialist countries.

The relative importance of alternative policy responses to external shocks in the 1979-81 period changes if interest rate effects are also considered. The inclusion of these effects entails a corresponding increase in additional net external financing in trade with private market economies, and hence in total trade, for both Hungary and Yugoslavia because the payment of higher interest rates is considered to involve additional external financing.

As noted earlier, interest rate effects equalled approximately 2 percent of GNP in Hungary and Yugoslavia in the 1979-81 period. Correspondingly, their inclusion more than doubles the ratio of external shocks to GNP in trade with private market economies in Hungary and increases it by over two-fifths in Yugoslavia while the ratio for total trade rises by over one-fourth in the first case and by one-third in the second.

### *B. Additional net external financing*

In Hungary, the extent of additional net external financing in trade with private market economies changed dramatically between the 1974-76 and the 1979-81 periods. While in 1974-76 additional net external financing equalled 45 percent of the average value of this trade, it averaged −2 percent in the 1979-81 period. This change reflects the fact that large borrowings in earlier years limited Hungary's possibilities to obtain additional loans from foreign private banks.

A similar change occurred somewhat later in Yugoslavia. Additional net external financing still accounted for 46 percent of the average value of trade with private market economies in 1979, declining subsequently to 30 percent in 1980 and 15 percent in 1981. The average ratio for the 1979-81 period was 31 percent, compared with 61 percent in 1974-76.

While credit lines from the Soviet Union made it possible for Hungary to have additional net external financing equalling 5 percent of the average value of trade with socialist economies in 1974-76, such financing became nil in 1979-81 as Hungary's trade deficit with these countries gradually turned into a surplus (measured in "1977" prices). In turn, Yugoslavia relied on domestic adjustments to offset the adverse balance-of-payments effects of external shocks in trade with socialist economies in 1974–76, and it had negative additional net external financing in trade with these countries in 1979–81, indicating the existence of reverse credit flows.

On the aggregate level, additional net external financing in trade with both private market and socialist economies declined from 8 percent of GNP in 1974–76 to −1 percent of GNP in 1979–81 in Hungary; the corresponding decline in Yugoslavia was from 5 percent of GNP in 1974–76 to 3 percent in 1979–81. If financing to cover the effects of higher interest rates is added to the 1979–81 calculations, total additional financing amounted to 1 percent of GNP in Hungary and to 5 percent in Yugoslavia in 1979–81.

### *C. Export promotion*

In the 1974–76 period, Hungary experienced a substantial deterioration in its export performance in trade with private market economies, with the decline of export shares compared to "1972" representing a 15 percent fall in export value. Losses in export market shares occurred across-the-board, with slightly greater than average declines for manufactured exports and smaller than average declines for primary exports.

The results for manufactured exports indicate the adverse effects of the policies applied. In an effort to avoid the transmission of world inflation to Hungary, the forint was revalued vis-a-vis the U.S. dollar, leading to its appreciation in real terms after 1974 (Table 3). Furthermore, taxes were imposed on what were considered "excess profits" in exporting, while firms making losses in exporting received subsidies. The overall result of these measures was increasingly to isolate prices received by exporters from world market prices, thereby reducing their incentive effects.

TABLE 3.—REAL EXCHANGE RATES IN HUNGARY AND YUGOSLAVIA

| | Average 1971–73 | 1974 | 1975 | 1976 | 1977 | 1978 | Average 1976–78 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hungary: | | | | | | | | | | | |
| Forint/US$ exchange rate | 100.0 | 85.5 | 80.4 | 76.0 | 74.9 | 69.3 | 100.0 | 88.6 | 81.0 | 85.5 | 91.2 |
| Real exchange rate vis-a-vis U.S. dollar | 100.0 | 106.4 | 99.9 | 94.5 | 97.1 | 93.6 | 100.0 | 102.2 | 92.7 | 100.3 | 104.3 |
| Real exchange rate vis-a-vis major trading partners | 100.0 | 116.7 | 111.1 | 100.8 | 107.0 | 109.7 | 100.0 | 109.7 | 95.4 | 86.3 | 84.7 |
| Yugoslavia: | | | | | | | | | | | |
| Dinar/US$ exchange rate | 100.0 | 99.2 | 108.3 | 113.4 | 114.0 | 116.2 | 100.0 | 103.4 | 135.5 | 193.2 | 279.3 |
| Real exchange rate vis-a-vis U.S. dollar | 100.0 | 90.2 | 88.0 | 91.4 | 88.5 | 90.1 | 100.0 | 101.7 | 118.6 | 129.1 | 151.9 |
| Real exchange rate vis-a-vis major trading partners | 100.0 | 96.3 | 94.9 | 93.3 | 93.1 | 101.2 | 100.0 | 110.4 | 126.5 | 114.1 | 128.4 |

Source: International Monetary Fund, international Financial Statistics and World Bank, Economic and social data bank.

The appreciation of the forint in real terms also contributed to the deterioration of Hungary's export performance in primary products after 1974. But, in this case, an extraneous factor—the limitation of EEC imports of livestock and meat—also affected the outcome.

In subsequent years, Hungary eliminated taxes on exports and reformed its system of prices. However, the regulations introduced on January 1, 1980 tended to discourage the expansion of manufactured exports whenever these had lower than average export prices or export profitability, even though such sales might have been in the national interest. This was the case because price adjustments on domestic sales were made dependent on increases in export prices and on the profitability of exports.[10] The situation was further aggravated by the appreciation of the forint in real terms after 1979.

These considerations may explain why after January 1, 1980 Hungary increasingly lost market shares in its manufactured exports to private market economies. While the loss was 3 percent of the average value of exports in 1979, compared with "1977" market shares, it rose to 11 percent in 1980 and to 24 percent in 1981. The appreciation of the exchange rate also affected primary exports, but these were not subject to the described price regulations. Correspondingly, they experienced only small losses in market shares in the 1979-81 period. All in all, losses in Hungary's export shares in trade with private market economies averaged 9 percent of export value in 1979-81.

In turn, Hungary made some gains in exporting to socialist countries, with its average market share rising by 3 percent in 1974-76 and by 8 percent in 1979-81. Exports to socialist countries are governed by bilateral trade agreements rather than by incentives, and the results appear to reflect increased demand for Hungarian products in these countries and a diversion of exports to them. Such a diversion occurred, in particular, as Hungary encountered limitations in exporting livestock and meat to the EEC and was able to sell these commodities to socialist countries for convertible currencies.

Gains in market shares in trade with socialist countries mitigated the losses Hungary suffered in exports to private market economies in 1974-76 and slightly more than offset these losses in 1979-81. Since the majority of Hungarian exports to socialist economies continued to be purchased on a nonconvertible basis, however, export gains to these economies eased Hungary's balance of payments constraint in hard currencies only to the extent that they could be used to substitute import purchases from these economies for hard-currency imports from private market economies. This was not generally the case. Also, Hungary's exports to socialist countries may have incorporated inputs purchased from private market economies.

In the 1974-76 period, Yugoslavia suffered even larger losses than Hungary in export market shares in its trade with private market economies, with a decline of 24 percent compared with its "1972" shares. Above-average losses were experienced in traditional primary exports (chiefly meat and copper ore), below-average losses in nontraditional primary exports, and average losses in manufactured exports. These results may be explained by the appreciation of the real value of the dinar (Table 3) and by policies that increased incentives for import substitution and discriminated against exports. These policies included higher import protection through quotas and preferential credit allocation to import substituting investments.[11] As in the Hungarian case, primary exports were further adversely affected by the EEC ban on imports of meat and livestock from non-member countries.

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[10] For a detailed discussion, see Bela Balassa, "Reforming the New Economic Mechanism in Hungary," Journal of Comparative Economics, September 1983, pp. 253-76; published in Hungarian in Közgazdasági Szemle (Economic Review), July-August, 1982, pp. 827-42.

After 1979, the dinar was devalued to a considerable extent in real terms, and direct pressure was applied on enterprises to earn a larger proportion of their convertible currency requirements through exports. As a result, losses in export shares in trade with private market economies were only 8 percent in 1979–81, compared with Yugoslavia's "1977" shares. As in the 1974–76 period, the largest loss in export shares occurred in traditional primary exports, followed by manufactured goods and nontraditional primary products.

Yugoslavia, like Hungary, gained export market shares in trade with socialist countries during both the 1974–76 and 1979–81 periods. The gains amounted to 9 percent of exports to socialist countries in 1974–76 and 20 percent in 1979–81. Primary as well as manufactured exports participated in the expansion. As in Hungary, the gains mitigated the losses suffered in exports to private market economies in 1974–76, with a slight overall gain in 1979–81.

### *D. Import substitution*

Hungary experienced some import substitution in trade with private market economies, representing savings of 9 percent of the value of imports in this trade in 1974–76 and 5 percent in 1979–81. The corresponding results were 2 percent and 7 percent in trade with socialist countries. Import savings amounted to 5 percent of total import value in 1974–76 and 6 percent in 1979–81.

Larger than average reductions were experienced in fuel imports, reflecting the efforts made to save fuel. This result obtained in trade with both private market and socialist economies in 1974–76 whereas import shares increased in trade with the former and declined in trade with the latter in 1979–81. In the later period, Hungary increased reliance on oil imports from private market economies, albeit their share in Hungary's total oil imports remained small in absolute terms. However, Hungary also had to pay for an increasing proportion of oil imported from the Soviet Union in convertible currencies.

Import substitution in trade with private market economies was more pronounced in Yugoslavia than in Hungary during the 1974–76 period, with savings amounting to 19 percent of the value of imports in this trade. Import savings were concentrated in nonfuel products and reflected the effects of the incentives for import substitution through increased protection and preferential credit allocation. When incentives to import substitution were reduced in 1979–81, import savings decreased to 7 percent of the value of imports from private market economies. In turn, in Yugoslavia's trade with socialist countries, import savings amounted to 4 percent of import value in 1974-76 and 6 percent in 1979-81. The corresponding results in Yugoslavia's overall trade were 15 percent and 7 percent, respectively.

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[11] For a detailed discussion see Sherman Robinson and Laura Tyson, "Foreign Trade, Resource Allocation, and Structural Adjustment in Yugoslavia," World Bank Development Research Department, Discussion Paper No. 57, September 1983.

### *E. Macroeconomic policies*

Hungary and Yugoslavia failed to apply restrictive macroeconomic policies in response to external shocks in 1974 and 1975, and the measures applied in 1976 remained temporary. Instead, the two countries relied on additional net external financing to maintain earlier rates of economic growth. This course of action was made possible by the easy availability of loans from foreign private banks.

As a result, external debt in convertible currencies, adjusted for changes in foreign exchange reserves, rose from 11 percent of the gross national product in 1973 to 22 percent in 1976 in Hungary, reaching 28 percent by 1978; the corresponding ratios were 11 percent, 14 percent, and 16 percent for Yugoslavia, where debt service charges (net interest payments and amortization) increased from 61 percent of merchandise exports in 1973 to 71 percent in 1978.[12] (Information on the amortization of foreign loans is not available for Hungary.)

The growing indebtedness of the two countries created difficulties for further borrowing when the second oil shock occurred. The situation was aggravated by the fact that foreign commercial banks became increasingly reluctant to lend to Eastern European countries. As the wisdom of additional borrowing came to be questioned and external credit market conditions tightened, Hungary applied restrictive macroeconomic measures in 1979 and Yugoslavia in 1980.

## III. ECONOMIC POLICIES AND EXTERNAL SHOCKS

Having examined the adjustment policies adopted by Hungary and Yugoslavia in the 1974-76 and 1979-81 periods, in the remainder of the paper we will briefly review the overall economic policies of the two countries, beginning from the early 1970's. The discussion will relate these policies to the adjustment responses identified in the preceding analysis.

### *A. Economic policies in Hungary*

The Hungarian economic reform of 1968 aimed at replacing plan directives by market relations; limiting the scope of central price determination; linking the domestic prices of exports and imports to prices in the world market; and decentralizing a major part of investment decisions. Also, greater freedom was provided to rural cooperatives in the choice of the scope of their activities.

Following the Party resolution of November 1972, some degree of recentralization occurred, with the supervising ministries increasing their interventions in enterprise decision-making and the introduction of various state "preferences" influencing the choice of investments. The extent of interventions increased further after 1973 as the policy makers attempted to isolate the Hungarian economy from world inflation.[13]

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[12] Balassa and Tyson, op, cit., Table 2—In interpreting the debt service ratio, it should be noted that the export data do not include services and private transfers, largely tourism and workers remittances, that are of considerable importance in Yugoslavia.

For this purpose, use was made of export subsidies and taxes as well as of import taxes, and production taxes set on a firm-by-firm basis came into widespread use. As a result, the profitability of the firms became increasingly dependent on decisions taken by the supervising ministry. This, in turn, led to increased interventions and firms themselves turned to the ministry for financial support. At the same time, distortions were introduced between domestic and world market prices that discouraged adjustment in exports and imports in response to changing world market price relations.

Exports and import substitution were also discouraged by the buoyancy of the domestic market as the government failed to take restrictive measures in response to the external shocks suffered after 1973. In fact, domestic consumption (private and public) increased by 6 percent in 1974 and by 5 percent in 1975. The situation was aggravated by the investment boom, with gross domestic investment rising by 23 percent in 1974 and 10 percent in 1975 (Table 4).

TABLE 4.—THE GROSS DOMESTIC PRODUCT AND THE COMPONENTS OF AGGREGATE DEMAND

[Annual rates of growth]

| | Hungary | | | | Yugoslavia | | | |
|---|---|---|---|---|---|---|---|---|
| | Gross domestic product | Aggregate domestic expenditure | Total consumption | Gross domestic investment | Gross domestic product | Aggregate domestic expenditure | Total consumption | Gross domestic investment |
| 1971 | 6.2 | 10.7 | 5.7 | 22.0 | 8.8 | 9.8 | 10.0 | 9.4 |
| 1972 | 6.1 | −2.1 | 3.1 | −12.4 | 3.6 | −.2 | 2.9 | −7.6 |
| 1973 | 6.9 | 2.7 | 3.9 | .3 | 2.6 | 3.8 | 1.0 | 11.4 |
| 1974 | 5.8 | 11.4 | 6.4 | 22.9 | 14.6 | 18.1 | 22.1 | 8.5 |
| 1975 | 6.3 | 6.4 | 4.6 | 10.2 | .9 | .3 | −3.3 | 10.1 |
| 1976 | 3.5 | 2.1 | 2.1 | 2.0 | 5.3 | 1.1 | 0 | 3.6 |
| 1977 | 7.6 | 6.2 | 4.4 | 9.6 | 8.4 | 12.1 | 9.8 | 17.4 |
| 1978 | 4.4 | 9.2 | 4.5 | 17.9 | 8.5 | 7.8 | 13.0 | −3.2 |
| 1979 | 2.7 | −3.5 | 2.8 | −14.1 | 4.2 | 6.1 | 3.8 | 12.0 |
| 1980 | .2 | −.6 | 1.0 | −3.8 | 2.3 | −1.8 | −2.4 | −9.3 |
| 1981 | 2.9 | 1.4 | 2.9 | −2.2 | 1.4 | −1.3 | −1.7 | −.4 |
| 1982 | 2.5 | −.4 | 1.2 | −4.5 | .8 | −.1 | 3.8 | −7.8 |
| 1970–73 | 6.4 | 3.6 | 4.2 | 2.3 | 5.0 | 4.4 | 4.6 | 4.0 |
| 1973–76 | 5.2 | 6.6 | 4.4 | 11.4 | 6.8 | 6.2 | 5.7 | 7.4 |
| 1976–79 | 4.9 | 3.8 | 3.9 | 3.6 | 7.0 | 8.7 | 8.8 | 8.4 |
| 1973–79 | 5.1 | 5.2 | 4.2 | 7.4 | 6.9 | 7.4 | 7.2 | 7.9 |
| 1979–82 | 1.9 | .1 | 1.7 | −3.3 | 1.5 | −1.1 | 1.5 | −5.4 |

Source: World Bank economic and social data bank.

The rate of growth of consumption as well as of investment declined to 2 percent in 1976, but the respite was temporary. Thus, consumption rose again by 4 percent in 1977 and 5 percent in 1978 while gross domestic investment increased by 10 percent and 18 percent. These changes reinforced the adverse effects of external shocks on Hungary's balance of payments and led to increased foreign indebtedness.

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[13] For a detailed discussion, see Bela Balassa, "The Economic Reform in Hungary Ten Years After," European Economic Review, December 1978, pp. 245–68. Reprinted as Essay 14 in Bela Balassa, The Newly Industrializing Countries in the World Economy, New York, Pergamon Press, 1981, pp. 329–46 and published in Hungarian in Valóság (Reality) 1978 (7), pp. 27–41.

The results reflected a desire to maintain earlier consumption growth rates as well as the lack of restraints on investment activity. And while controls were applied in 1976 to reduce the imports of machinery and equipment, they were not continued in 1977. Also, considerable inventory accumulation occurred in anticipation of the price increases of 1979.

Prices were raised in 1979 and, again, in 1980 in the framework of price reforms aimed at aligning Hungarian prices with world market prices. Thus, the domestic prices of raw materials, fuels, and basic intermediate products were equated to import prices paid in convertible currency trade, involving substantial increases in these prices. In turn, exporters received the domestic currency equivalent of the price obtained in convertible currencies plus a rebate for imputed indirect taxes, with a higher rebate rate paid for a transitional period of five years to high-cost exporters. At the same time, as noted above, modifications in prices on domestic sales were made contingent on changes in the prices and the profitability of exports. Subsequently, however, these regulations have been changed so as to reduce disincentives to exports.

Also, firms were given greater freedom in their investment decisions and day-to-day intervention in firm decision-making was reduced. The reversal of the process of recentralization was given increased impetus by the consolidation of the industrial ministries on January 1, 1981. Finally, considerably greater scope was given to the private sector on January 1, 1982.[14]

At the same time, measures were taken to cut back investment activity by reducing the volume of investment credits, requiring enterprises to reduce their inventories, and limiting access to imported machinery and equipment. As a result, gross domestic investment fell by 14 percent in 1979, by 4 percent in 1980, and by 2 percent in 1981, with a further decline of 5 percent occurring in 1982.

Wage restraints were further applied to limit the growth of consumption. Nevertheless, consumption continued to rise at annual rates between 1 and 3 percent a year in the 1978–82 period. The announced austerity program in Hungary thus did not entail an absolute decline in consumption as similar austerity programs did in newly-industrializing developing countries with high foreign indebtedness. In fact, in 1982 consumption exceeded the 1975 level by 20 percent while gross domestic investment fell to the level of that year. And net investment in 1982 was 28 percent below the 1973 level (Statisztikai Evkönyv, 1982, p. 62).

It may be suggested that absolute declines in consumption would have been necessary both to limit the length of the period of adjustment and to avoid large cutbacks of investment activity that will limit future economic growth. In this connection, reference may be made to the overestimation of the level of investment and to the paucity of new investments in Hungary.

According to official statistics, notwithstanding the decline that occurred, the share of gross domestic investment in GNP was still

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[14] On the recent reform measures see Bela Balassa, "Reforming the New Economic Mechanism in Hungary," op. cit.

28 percent in 1982. However, this result represents an overestimate because the subsidization of the consumption of a number of necessities has reduced the relative price of consumption and increased that of investment. Thus, according to calculations made in the framework of the United Nations International Comparison Project, the share of gross domestic investment in Hungary's gross domestic product was 39 percent in domestic prices and 33 percent at purchasing power parities in 1975.[15]

At the same time, the investment cutbacks related largely to new projects, with the large majority of the ongoing investments continuing. Yet, several of these projects have doubtful social profitability and new investments would be necessary for efficient exporting and import substitution in Hungary.

### *B. Economic policies in Yugoslavia*

The economic reforms culminating in the mid-sixties established a self-management system in Yugoslavia, in which production and investment decisions were largely made by the enterprises. At the same time, banks came to play an increasingly important role as financial intermediaries and, in the presence of continuing excess demand for investment funds at excessively low interest rates, they employed non-price rationing in the allocation of loans. In so doing, the banks responded to pressures originating at the national, republican, and provincial levels.

Institutional changes introduced in 1974 and 1976 increased to a considerable extent administrative guidance over the allocation of investment, especially at the republican and provincial levels. The result was a priority allocation scheme that channeled funds to priority sectors and projects without sufficient attention to their national or even regional profitability and that strengthened tendencies toward duplication in regional investment projects.[16]

The 1974–76 institutional reforms also had deleterious effects on two other important aspects of economic policy making. First, the reforms largely dismantled the federation's power of decision making on economic policy and made consensus and bargaining among republics and provinces the lynchpin of policy formation and execution. The new system, although understandable, given Yugoslavia's longstanding sensitivity to regional concerns, was detrimental to the efficiency of resource allocation and made timely response at the national level extremely difficult. Second, the reforms established an elaborate apparatus for allocating foreign exchange that resulted in increasing administrative intervention, mainly at the republican level. The new foreign exchange allocation apparatus was employed to ration increasingly scarce foreign exchange among competing users in ways that produced a growing bias in incentives against exports and in favor of production for the home market.

The adverse economic effects of the new procedures used to allocate investment funds were aggravated by the continuing operation of the investment cycle in Yugoslavia that largely paralleled the investment cycle in Hungary.[17] Thus, the Yugoslav authorities failed to act to reduce investment activity in response to the external shocks suffered after 1973. Rather, gross domestic investment increased by 9 percent in 1974 and by 10 percent in 1975 (Table 4). As in Hungary, a temporary slowdown occurred in 1976 but this was followed by an increase to 17 percent in 1977 under the ambitious 1976–80 Second Plan. And while the level of investment declined slightly in 1978, this was followed by an increase of 12 percent in 1979.

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[15] Irving B. Kravis, Alan Heston, and Robert Summers, "World Product and Income: International Comparisons of Real Gross Product," Baltimore, MD., pp. 170, 186.

[16] On investment allocation in Yugoslavia, see Laura Tyson, "The Yugoslav Economic System and Its Performance in the 1970s," Berkeley, Cal., University of California, Institute for International Studies, 1981.

In contradistinction to Hungary, domestic consumption fluctuated to a considerable extent in Yugoslavia, with an increase of 22 percent in 1974 followed by a 3 percent decline in 1975 and no change occurring in 1976. In the 1973–76 peirod, taken together, consumption rose at an average annual rate of 6 percent. The rate of increase accelerated in the 1976–79 period, when consumption grew by 9 percent a year, on the average.

Altogether, aggregate domestic expenditure rose at an unsustainable rate of 9 percent a year between 1976 and 1979. This would have given rise to a substantial deterioration in the balance of payments, even in the absence of the external shocks on the trade account and the slowdown in the growth of workers' remittances that occurred during the period. At the same time, the institutional mechanisms introduced in 1974–76 for the allocation of investment funds and foreign exchange produced serious inefficiencies in resource allocation that adversely affected economic performance.

In the face of external and internal imbalances, the Yugoslav authorities continued to rely on borrowing abroad. As a result, the ratio of debt service to merchandise exports rose from 71 percent in 1978 to 75 percent in 1979 and 81 percent in 1980 while the external debt in terms of convertible currencies increased from 16 percent of GNP in 1978 to 21 percent in 1979 and 22 percent in 1980. By contrast, in Hungary, the ratio of the external debt to GNP declined from 28 percent in 1978 to 26 percent in 1979 and 24 percent in 1980.[18]

In Yugoslavia, domestic adjustment measures were taken only in mid-1980, leading to reduced borrowing in the following year. The delay in adjustment was in part a consequence of the policy paralysis at the time of Tito's illness and death and in part a consequence of the new consensual form of decision making that slowed down the policy response process.

While the exchange rate was devalued to a considerable extent, the adjustment largely involved the application of deflationary measures, at least in 1980 and 1981. Aggregate domestic expenditure declined by 2 percent in 1980 and by 1 percent in 1981, while practically no further decline occurred in 1982. As in Hungary, the measures applied concentrated on reducing investment rather than consumption, although the investment cycle continued to operate. Investment fell by 9 percent in 1980, remained stationary in 1981 and declined by 8 percent in 1982. In turn, a 2 percent increase in consumption in 1980 was followed by a 2 percent decline in the following year and a 4 percent rise in 1982.

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[17] For a detailed discussion, see Laura Tyson, "Investment Allocation: Comparsions of Reform Experiences of Hungary and Yugoslavia," Journal of Comparative Economics, September 1983, pp. 288–305.

[18] For sources, see Balassa and Tyson, op. cit., Table 2.

As in Hungary, despite successive decreases in recent years, Yugoslavia's investment share in GNP remains high by international standards, although there is evidence of overestimation for the reasons mentioned in the case of Hungary. At the same time, in the absence of a reform of the investment allocation mechanism, cutbacks in investment were introduced across the board rather than focusing on projects of doubtful economic profitability.[19]

### *C. Concluding remarks*

This paper has provided an evaluation of adjustment policies in Hungary and Yugoslavia in response to the external shocks they suffered during the 1974–76 and 1979–81 periods. The results show considerable parallels between the two countries.

Neither of the two countries took macroeconomic adjustment measures in response to external shocks in the years 1974 and 1975. Rather, they maintained earlier rates of consumption growth and exhibited substantial increases in investment. And while measures were taken by both countries to restrain aggregate expenditures in 1976, these measures were subsequently reversed.

In the first period, Yugoslavia gave incentives to import substitution that discriminated against exports, leading to losses in export market shares in trade with private market economies. In Hungary, the same result occurred as the government attempted to isolate domestic prices from price changes in world markets through the use of tax/subsidy measures.

Losses in export market shares offset much of the effects of import substitution in the two countries. With the lack of restrictive macroeconomic policies, then, both countries relied largely on additional net external financing to offset the adverse balance-of-payments effects of external shocks. This was made possible by the willingness of foreign commercial banks to provide the necessary financing.

With external borrowing continuing in 1977 and in 1978, both countries incurred a large indebtedness vis-a-vis foreign banks, thereby reducing their possibilities for further borrowing at the time of the external shocks of 1979–81. The situation was aggravated by the reluctance of the banks to increase their exposure in Eastern Europe. Correspondingly, both countries adopted strong macroeconomic adjustment measures. The measures applied bore heavily on investment in the two countries, but there were differences between them in the timing of their introduction.

Hungary adopted a stabilization program in 1979 that permitted eliminating reliance on additional net external financing. Yugoslavia introduced stabilization measures a year later than Hungary and continued with foreign borrowing, albeit at a reduced rate.

But, owing to the repeated devaluations that led to a substantial depreciation of the dinar in real terms, Yugoslavia has been able to improve its export position in private market economies since 1979 while the opposite has happened in Hungary whose real exchange rate appreciated until the devaluation that occurred in mid-1982 (Table 3). At the same time, both Hungary and Yugoslavia have made increased use of import restrictions.

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[19] See the papers by Laura Tyson referred to above.

Finally, adjustment policies in both countries have involved largely deflationary measures that hit investment particularly hard. In the future, it would be desirable to give greater emphasis to output-increasing policies, involving export promotion as well as efficient import substitution, both to ensure increases in living standards and to provide the investment necessary for long-term economic growth.

## Section B. Measurements of GNP and Growth

# EAST EUROPEAN GNP'S: ORIGINS OF PRODUCT, FINAL USES, RATES OF GROWTH, AND INTERNATIONAL COMPARISONS *

By Thad P. Alton

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## SUMMARY

Our independent findings on East European economic performance, 1965-1982, are presented in the GNP and GNP-related measures in tables; see the list of tables for topics of particular interest and the text for comments on them. For purposes of intertemporal comparisons for a given country and for international comparisons among countries within the Council for Mutual Economic Assistance (CMEA) and with countries reporting their performance in the GNP concept, our findings expressed in valuations approximating factor cost and in a uniform methodology should provide symmetry that is not afforded by official East European countries' net material product (NMP) national income statistics in realized prices.

Over the 1965–1982 period, the East European countries have reached and maintained levels of industrialization that, expressed as percentage shares of industry in GNP, in most instances are higher than those in Western Europe, the United States, and Japan in 1979–1980. The shares of agriculture in Eastern Europe have declined over the period, but still range from 13 to 27 percent of GNP, as compared to two to four percent for the advanced Western countries and Japan. Private final consumption as a share of total final domestic uses shows substantial stability in Eastern Europe, 1965–1982, around 60 percent, which is about the average level around 1980 for the Western countries and Japan.

The share of total population defined as "economically active" has stayed around 50 percent since 1960 in Eastern Europe, as compared to a range of 40 to 47 percent for West European countries and the United States. The structure and growth of employment in Eastern Europe broadly conforms to the structure and trends of GNP. Industry is the major employer, except in Poland where agriculture employs about the same share as industry in 1981–1982. In socialized industry, the machinery branch is the largest, accounting for between 27 percent (Bulgaria) and 43 percent (the GDR) of the total. In fixed capital, industry has the largest share (in 1981 between 28 and 44 percent of the total for the economy) and industrial capital generally has grown faster than that of other sectors.

Comparisons of growth rates of GNP per capita among countries at various levels of development should be made with suitable cautions, but the general impression that our indexes of growth provide is that the rate of growth in Eastern Europe as a whole in 1965–1980 was around 3.1 percent per year, in 1970–1975 about 4.1 percent, in 1975–1980 about 1.3 percent, and in 1980–1982 declining by about one percent per year. For a number of non-CMEA countries (six European, UK, US, and Japan), the performance by this measure would appear substantially better in 1965–1970, perhaps a bit worse in 1970–1975, better again in 1975–1980, and more or less equally dismal in 1980–1982. The magnitudes are such as to suggest that economic growth was not very dissimilar between the two groups of countries. Perhaps one should expect more rapid growth from the less mature economies of Eastern Europe.

Average annual growth rates in countries of Eastern Europe by sectors of production show in most instances industry growing more rapidly than total GNP, and agriculture much less rapidly than the total. Trends in domestic final uses of product over the 1965–1982 period show private consumption, except in Hungary, growing less rapidly than the available total for 1965–1975, but more rapidly in 1975–1982. Selected civilian government services generally show a similar pattern. Residual final uses, comprising mostly gross investment and defense, show opposite trends: more rapid growth than the available total, 1965–1975, and less rapid thereafter. In most of the countries, this residual shows very substantial absolute declines since the mid-1970s; the GDR and Romania are exceptions.

With labor inputs growing slowly, the growth of output depends on growth of labor productivity, which in turn depends on a number of socio-economic factors. In all the East European countries, labor productivity (GNP based) increased modestly in 1970–1975 over 1965–1970, but its rate of growth fell steeply in 1975–1980 and 1981.

The dollar magnitudes of the East European GNPs are of immediate interest in providing weights for estimating the growth of the six countries combined. Our figures (Table 24), based as they are on the UN International Comparisons Project (ICP) calculations relying on detailed purchasing power parity ratios, should have meaning and preference over alternative estimates as to real validity because of the ICP's estimates meeting transitive tests and their stated direct price observations. For 1982, the East European average per capita dollar GDP at 50 percent of the US level, as shown in Table 24, would appear far more acceptable than misleading official exchange rate based calculations. The latter, at least in the case of Hungary, imply a per capital level 16 percent of that of the US, and if carried back to 1950 by official Hungarian NMP growth measures, only seven percent in 1950. Exchange rate based international comparisons of GNPs in US dollars probably are more misleading than helpful for realistic comparisons and public policy. Real growth rates calculated in a standard way are important for moving dollar comparisons from a given year to other years. NMP growth rates as surrogates GNP growth rates thus applied to some point estimates may lead to implausible conclusions.

In the early post-World War II period East European growth of production relied strongly on reserves of labor in agriculture, on easy transfers of existing technology, on high rates of investment, and on the ability of the Communist-led governments to command resource allocation, among other factors. With the passing years, labor has become scarce, technology transfers more costly, consumer expectations higher, and the governments' ability to enforce labor discipline weakened. With the sharply reduced levels of investment in recent years, the prognosis for early resumption of high growth is at best conditional. A major condition is the will of the population to work; this requires strong motivation for personal gain from effort spent. The big question is whether the substance under the label of socialized economy can be "reprivatized". The reserves of underutilized labor holding tenure positions are great. The big uncertainty is the ability of the governments to institute reforms to provide incentives to effort and innovation. This challenge to increasing productivity needs to be faced also in Western countries.

## I. INTRODUCTION

The findings in this paper are essentially the independent measures of East European economic performance shown in the statistical tables. Reference to the list of tables should enable the reader to study those of particular interest to him. We present also tables of official East European statistics on production and uses of national product, which, because of differences of concept, methodology, and valuation are not comparable with our similarly named tables. Detailed description of the sources and methodology of our independently derived tables are provided in our Occasional Paper series;[1] the sources for the East European national data are the respective countries' general statistical yearbooks and, in some instances, the national data as presented in the statistical yearbook of the Council on Mutual Economic Assistance (CMEA).

Because statistical series must from time to time be revised and expressed in more recent bases of valuation, one should expect differences to appear as regards the structure of economic activity for particular years and for rates of growth of sectors of activity in a given period. These differences will appear in the official statistical series of a given country and in comparison with those statistics as summarized in CMEA yearbooks. Changes in bases of valuation will also result in such differences in the official statistics of non-CMEA countries and in our independent measures of Eastern Europe at points of, and in some segments of, overlap. This comes under the heading of index number problems. The caution to be observed here is to be aware of such changes and their relevance for particular purposes. The standard approach is to change the bases of valuation from time to time and to link the corresponding indexes. Substantial discontinuities in statistical series can be diminished by frequent changes in the bases of valuation. Hungary, for example, provides some indexes in a creeping set of weights presenting linked annual values calculated as the geometric averages in the weights of the given year and the preceding year. If symmetry of international comparisons is to be maintained, the relevant measures should, of course, be in the same concept, the same methodology, and in valuations that do not depart widely from factor cost.

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[1] Research Project on National Income in East Central Europe, Economic Studies of L.W. International Financial Research, Inc., Occasional Papers, various titles, numbers, and dates, New York.

Our independent measures are based on the United Nations standard national accounts (SNA) definitions and are calculated in values approximating factor cost. This uniform approach using the GNP concept should result in greater symmetry of comparability over time for a given country and likewise for international comparisons within CMEA and with Western countries. The net material product (NMP) national income concept followed in Eastern Europe is a truncated version of GNP by virtue of exclusion of service sectors regarded as nonmaterial. Official calculations of economic structure and growth for a recent period at approximations to factor cost in Poland have been in general agreement with our independently derived measures. The expressed conclusion by the Polish statisticians is that factor cost based measures are essential for understanding the past and present and for planning for the future, and that statistics in actually realized prices also are important. Until such time as the domestic price systems are reformed to align them more closely to costs and scarcities, calculation in both factor cost and realized prices will be required.

The quality and availability of East European economic statistics varies from country to country. Romania and Bulgaria rank at the bottom of the list; Hungary and Poland at the top. East European countries fall short of the extent of detail one finds in the official statistics of the United States. This observation applies most strongly to providing detail on final uses of national product, especially as regards military expenditures and subdivision of final uses and value added components in the input-output tables and other summary statistics. Reference to tables of the official NMP statistics and our independent GNP measures for the most recent years show that the gap in rates of growth as measured in percentage points in general has narrowed.

East European statistics on employment are various, depending on the country. For example, Romania and Bulgaria provide statistics according to the concept of "economically active" population; the other countries give data in full man-year equivalents. Users of official data are advised to study the introductory notes, footnotes, and reference material to understand better the content of given data. Regrettably, such explanations often are not broadly published or are not detailed enough.

In contructing our GNP indexes for East European government services we have used employment series, allowing no changes for productivity. We think this assumption is valid generally for Eastern Europe, but if an alternative assumption, probably no less arbitrary, were to allow modest increases in productivity, the consequence for overall GNP growth would be relatively unimportant in view of the low weight that such services have in the total. We have calculated our GNP indexes with some suggested modifications of our sectoral weights, but the consequences for growth rates were not important.

## II. STRUCTURE OF PRODUCTION, FINAL USES OF PRODUCT, AND FACTOR INPUTS

In this section, we examine the performance of the East European economies as shown in the changing composition of value added in production, in final uses of product, and in inputs of factors of production: labor and capital. Our findings on the structure of economic activity will be presented in Tables 2-10. Summary statistics on population given in Table 1 provide a basis for derivation of per capita measures.

### POPULATION: NUMBERS AND INDEXES OF GROWTH

Population statistics provide extremely rough indications of economic protential, particularly where comparisons are made between countries at sharply differing levels of industrial development. Where such levels do not vastly differ, an initial impression of the economic significance of a country, or a group of countries, may be gained by reference to demographic statistics. The population data in Table 1 show a total population of 110.4 million for the six countries for mid-year 1982. For comparison, other mid-year 1982 populations in millions were as follows: United States—232.5, USSR—270.0, France—54.2, Federal Republic of Germany (including West Berlin)—61.8, and Italy—57.3.[2] Thus the six countries represent about 47 percent of the level of the United States and 41 percent of that of the USSR.

If recent trends continue, Eastern Europe will be facing increasing labor scarcities. Labor shortages already are strongly manifested in the GDR, which has the continued distinction of a declining population, Czechoslovakia, and Hungary. Even Bulgaria and Poland are concerned over labor shortages, though less acutely than are the other countries. The agricultural population in East Europe still constitutes a substantial reserve for transfers to other sectors despite its steeply declining share in the total of economically active population (see Table 7). It is against this background of relative labor scarcity compared to the earlier post-World II years that such great emphasis is being placed currently upon more rapid technological progress, capital investment, labor discipline, and incentives to promote efficiency, to make possible increased labor productivity.

We shall turn now to measures of economic performance as shown in structural changes in production, final uses of product, employment, and fixed capital.

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[2] Non-East European data: Statistical Abstract of the United States, 1982-1983, pp. 857-858.

## TABLE 1.—EAST EUROPEAN POPULATION, 1965–82

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Total |
|---|---|---|---|---|---|---|---|
| | | | 1. Midyear or annual average (thousands) | | | | |
| 1965 | 8,201 | 14,159 | 17,020 | 10,153 | 31,496 | 19,027 | 100,056 |
| 1966 | 8,258 | 14,240 | 17,058 | 10,185 | 31,698 | 19,141 | 100,580 |
| 1967 | 8,310 | 14,305 | 17,082 | 10,224 | 31,944 | 19,285 | 101,150 |
| 1968 | 8,370 | 14,361 | 17,084 | 10,264 | 32,305 | 19,721 | 102,105 |
| 1969 | 8,434 | 14,416 | 17,076 | 10,303 | 32,555 | 20,010 | 102,794 |
| 1970 | 8,490 | 14,334 | 17,058 | 10,337 | 32,526 | 20,253 | 102,997 |
| 1971 | 8,536 | 14,399 | 17,061 | 10,365 | 32,805 | 20,470 | 103,636 |
| 1972 | 8,576 | 14,465 | 17,043 | 10,394 | 33,058 | 20,663 | 104,209 |
| 1973 | 8,621 | 14,560 | 16,980 | 10,426 | 33,363 | 20,828 | 104,778 |
| 1974 | 8,679 | 14,686 | 16,925 | 10,472 | 33,691 | 21,029 | 105,481 |
| 1975 | 8,721 | 14,802 | 16,850 | 10,532 | 34,022 | 21,245 | 106,171 |
| 1976 | 8,759 | 14,918 | 16,786 | 10,589 | 34,362 | 21,446 | 106,859 |
| 1977 | 8,804 | 15,030 | 16,765 | 10,638 | 34,698 | 21,658 | 107,593 |
| 1978 | 8,814 | 15,137 | 16,756 | 10,674 | 35,010 | 21,855 | 108,246 |
| 1979 | 8,826 | 15,237 | 16,745 | 10,698 | 35,257 | 22,048 | 108,811 |
| 1980 | 8,862 | 15,311 | 16,737 | 10,711 | 35,578 | 22,201 | 109,400 |
| 1981 | 8,891 | 15,314 | 16,736 | 10,712 | 35,902 | 22,353 | 109,908 |
| 1982 | 8,917 | 15,370 | 16,732 | 10,706 | 36,227 | 22,465 | 110,416 |
| | | | 2. Indexes (1965=100) | | | | |
| 1965 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1966 | 100.7 | 100.6 | 100.2 | 100.3 | 100.6 | 100.6 | 100.5 |
| 1967 | 101.3 | 101.0 | 100.4 | 100.7 | 101.4 | 101.4 | 101.1 |
| 1968 | 102.1 | 101.4 | 100.4 | 101.1 | 102.6 | 103.6 | 102.0 |
| 1969 | 102.8 | 101.8 | 100.3 | 101.5 | 103.4 | 105.2 | 102.7 |
| 1970 | 103.5 | 101.2 | 100.2 | 101.8 | 103.3 | 106.4 | 102.9 |
| 1971 | 104.1 | 101.7 | 100.2 | 102.1 | 104.2 | 107.6 | 103.6 |
| 1972 | 104.6 | 102.2 | 100.1 | 102.4 | 105.0 | 108.6 | 104.2 |
| 1973 | 105.1 | 102.8 | 99.8 | 102.7 | 105.9 | 109.5 | 104.7 |
| 1974 | 105.8 | 103.7 | 99.4 | 103.1 | 107.0 | 110.5 | 105.4 |
| 1975 | 106.3 | 104.5 | 99.0 | 103.7 | 108.0 | 111.7 | 106.1 |
| 1976 | 106.8 | 105.4 | 98.6 | 104.3 | 109.1 | 112.7 | 106.8 |
| 1977 | 107.3 | 106.2 | 98.5 | 104.8 | 110.2 | 113.8 | 107.5 |
| 1978 | 107.5 | 106.9 | 98.4 | 105.1 | 111.2 | 114.9 | 108.2 |
| 1979 | 107.6 | 107.6 | 98.4 | 105.4 | 111.9 | 115.9 | 108.7 |
| 1980 | 108.0 | 108.1 | 98.3 | 105.5 | 113.0 | 116.7 | 109.3 |
| 1981 | 108.4 | 108.2 | 98.3 | 105.5 | 114.0 | 117.5 | 109.8 |
| 1982 | 108.7 | 108.6 | 98.3 | 105.4 | 115.0 | 118.1 | 110.4 |

Sources: Official statistical publications and plan fulfillment reports.

### COMPOSITION OF NATIONAL PRODUCT BY SECTORS OF ORIGIN

Tables 2, 3 and 4 indicate the changing composition of national product by industrial sector over the 1965–1982 period. Tables 2 and 3 are in the GNP or GDP concept, and Table 4 in the net material product national income concept. Before discussing the structural changes in these tables, some observations on concepts and methodology are warranted.

We use GNP or GDP in their conventional sense, referring to gross value added in production. NMP national income is a narrower and somewhat less value added concept on two counts: (1) it excludes as nonproductive various service sectors that GNP includes, and (2) in its calculation NMP subtracts from gross production only intermediate material costs and depreciation, even though inputs from the nonmaterial (service) sectors enter the gross value of production of the material sectors that buy these inputs. These purchases accordingly appear as an element in the NMP of the purchasing sector. Although such purchases are not very significant percentage-wise in total production, they contribute to ambiguity. This fact, and other, more important considerations, have provoked discussions in Eastern Europe as to the desirability of broadening the concept of production to include nonmaterial services. Some concession has already been made in this direction by including as material production the formerly excluded passenger transportation and communications services to household and nonmaterial sectors. Since 1970, only Czechoslovakia still follows the Soviet lead in excluding these particular services. The other five East European countries had expanded their NMP sphere by 1970, but their indexes of NMP production and the related structures of NMP national income have not in all sources been retrospectively adjusted to provide uniform coverage over extended time periods.

The methodology and detailed documentation of our GNP measures have been published in the Occasional Papers of the Research Project on National Income in East Central Europe. In brief, we have derived GNP sector of production weights within the material production sphere taking as an overall constraint the NMP produced in selected base years (a late 1960s year and a mid-1970s year) diminished by purchases by material sectors from the nonmaterial or so-called non-productive sphere. The resulting control value was attributed to labor and non-labor factors of production. This value was allocated (1) to labor returns, comprising wage and wage-like payments plus social security contributions, sector by sector, and (2) to non-labor factors of production by reducing the control total by the sum of labor returns and distributing the residual to production sectors on the basis of their percentage shares in the total of their depreciated values of fixed capital and working capital. The results for the material production sectors were augmented to reach the GNP concept by adding depreciation on fixed assets, and, further, by estimating the gross value added in the service sectors excluded from the NMP concept. Labor returns in these services were determined in the same sense as for the material sphere, non-labor net returns to capital were estimated at the same rate as for the material sphere, and depreciation similarly was estimated. Non-labor returns were included only in those service sectors where such returns are conventionally provided according to the SNA concept. The base-year structures, or weights, of GNP by sectors of origin of product were moved to other years by our GNP real indexes of production sectors, and the results are shown in Table 2 in percentage shares of total GNP. Detailed descriptions of our methodology and sources are provided in our Occasional Papers.[3]

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[3] Research Project on National Income in East Central Europe, Occasional Papers; see especially Nos. 48, 61, 64, 75, and 77. The GNP data presented in the present report are taken primarily from our Occasional Papers.

## TABLE 2.—COMPOSITION OF GROSS NATIONAL PRODUCT BY INDUSTRIAL ORIGIN, SELECTED YEARS, 1965–82

[In constant prices]

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Bulgaria: | | | | | | |
| Industry (including handicrafts) | 29.0 | 34.1 | 35.1 | 39.2 | 39.1 | 39.2 |
| Agriculture and forestry | 35.6 | 28.4 | 27.6 | 22.2 | 22.6 | 22.9 |
| Construction | 6.4 | 6.8 | 6.7 | 6.8 | 6.6 | 6.4 |
| Transport and communications | 6.1 | 8.3 | 8.1 | 9.2 | 9.3 | 9.3 |
| Trade | 5.2 | 6.2 | 7.2 | 7.3 | 7.2 | 7.2 |
| Housing | 7.0 | 6.1 | 4.4 | 4.8 | 4.8 | 4.7 |
| Government and other | 10.6 | 10.1 | 10.9 | 10.6 | 10.4 | 10.3 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Czechoslovakia: | | | | | | |
| Industry (including handicrafts) | 40.0 | 41.5 | 38.1 | 39.2 | 40.1 | 40.1 |
| Agriculture and forestry | 18.6 | 18.4 | 16.7 | 16.2 | 14.4 | 14.5 |
| Construction | 5.3 | 5.3 | 9.1 | 8.8 | 8.9 | 8.7 |
| Transport and communications | 10.5 | 10.0 | 7.7 | 8.1 | 8.3 | 8.2 |
| Trade | 6.8 | 7.8 | 9.0 | 8.7 | 8.8 | 8.9 |
| Housing | 9.6 | 8.5 | 9.6 | 9.3 | 9.5 | 9.6 |
| Government and other | 9.0 | 8.6 | 9.8 | 9.7 | 10.0 | 10.1 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| German Democratic Republic: | | | | | | |
| Industry (including handicrafts) | 41.0 | 42.5 | 42.8 | 44.1 | 44.7 | 45.4 |
| Agriculture and forestry | 15.8 | 13.8 | 14.6 | 13.6 | 13.6 | 12.7 |
| Construction | 4.7 | 5.8 | 5.2 | 5.3 | 5.1 | 5.2 |
| Transport and communications | 7.0 | 7.6 | 8.2 | 8.2 | 8.0 | 7.7 |
| Trade | 9.4 | 10.0 | 8.5 | 8.4 | 8.3 | 8.4 |
| Housing | 8.9 | 7.9 | 8.8 | 8.1 | 8.0 | 8.0 |
| Government and other | 13.2 | 12.5 | 11.9 | 12.1 | 12.2 | 12.5 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Hungary: | | | | | | |
| Industry (including handicrafts) | 33.6 | 34.3 | 31.4 | 31.7 | 31.6 | 31.3 |
| Agriculture and forestry | 25.9 | 22.4 | 25.6 | 25.0 | 24.8 | 25.5 |
| Construction | 4.5 | 5.6 | 7.4 | 6.9 | 6.7 | 6.5 |
| Transport and communications | 9.7 | 9.9 | 8.1 | 8.8 | 9.0 | 8.9 |
| Trade | 5.6 | 7.2 | 7.0 | 7.2 | 7.3 | 7.2 |
| Housing | 10.0 | 9.0 | 10.4 | 10.4 | 10.5 | 10.5 |
| Government and other | 10.8 | 11.4 | 10.0 | 10.0 | 10.1 | 10.1 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Poland: | | | | | | |
| Industry (including handicrafts) | 32.0 | 35.7 | 34.2 | 33.9 | 31.3 | 31.3 |
| Agriculture and forestry | 30.0 | 24.4 | 26.8 | 24.7 | 27.2 | 27.4 |
| Construction | 7.0 | 8.4 | 7.2 | 6.6 | 5.9 | 5.9 |
| Transport and communications | 7.8 | 8.7 | 7.3 | 8.5 | 7.8 | 7.3 |
| Trade | 6.0 | 6.5 | 6.1 | 6.3 | 6.3 | 5.5 |
| Housing | 7.5 | 7.3 | 8.5 | 9.4 | 10.1 | 10.7 |
| Government and other | 9.7 | 9.0 | 9.9 | 10.6 | 11.5 | 11.9 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Romania: | | | | | | |
| Industry (including handicrafts) | 26.4 | 35.5 | 38.9 | 39.7 | 39.4 | 38.7 |
| Agriculture and forestry | 42.1 | 31.3 | 25.8 | 24.9 | 24.9 | 26.1 |
| Construction | 6.7 | 7.5 | 7.2 | 7.4 | 7.0 | 6.7 |
| Transport and communications | 5.5 | 7.0 | 6.6 | 6.7 | 6.7 | 6.7 |
| Trade | 5.5 | 6.5 | 7.5 | 8.5 | 8.7 | 8.5 |
| Housing | 5.4 | 4.7 | 4.2 | 3.9 | 3.9 | 3.9 |

## TABLE 2.—COMPOSITION OF GROSS NATIONAL PRODUCT BY INDUSTRIAL ORIGIN, SELECTED YEARS, 1965–82—Continued

[In constant prices]

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Government and other | 8.4 | 7.5 | 9.8 | 9.0 | 9.4 | 9.4 |
| Total, GNP | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Derived from GNP measures shown in table 13.

## TABLE 3.—NON-CMEA COUNTRIES: PERCENTAGE DISTRIBUTION OF GDP BY INDUSTRIAL ORIGIN AND EXPENDITURES, SELECTED YEARS, 1978–80

[A. By industrial origin]

| Country | Year | GDP | Industry | Agriculture and forestry | Construction | Transport and communications | Trade | Other |
|---|---|---|---|---|---|---|---|---|
| Austria | 1980 | 100 | 32 | 4 | 8 | 6 | 17 | 33 |
| France | 1980 | 100 | 28 | 4 | 7 | 6 | 12 | 42 |
| Germany, Federal Republic | 1980 | 100 | 40 | 2 | 8 | 6 | 9 | 35 |
| Greece | 1980 | 100 | 20 | 15 | 8 | 7 | 11 | 39 |
| Italy | 1980 | 100 | 35 | 6 | 8 | 6 | 15 | 29 |
| Japan | 1980 | 100 | 34 | 4 | 9 | 7 | 12 | 34 |
| Spain | 1978 | 100 | 27 | 8 | 8 | 7 | 17 | 33 |
| United Kingdom | 1980 | 100 | 29 | 2 | 6 | 7 | 9 | 48 |
| United States | 1979 | 100 | 30 | 3 | 5 | 6 | 17 | 39 |

[B. By expenditures on GDP]

| | Year | GDP | Government final expenditure | Private final consumption | Increase in stocks | Gross fixed capital | Exports | Less imports |
|---|---|---|---|---|---|---|---|---|
| Austria | 1980 | 100 | 18 | 55 | 3 | 25 | 39 | 41 |
| France | 1980 | 100 | 15 | 63 | 2 | 22 | 22 | 24 |
| Germany, Federal Republic | 1980 | 100 | 20 | 55 | 1 | 24 | 27 | 27 |
| Greece | 1980 | 100 | 16 | 65 | 5 | 23 | 20 | 26 |
| Italy | 1980 | 100 | 16 | 62 | 5 | 20 | 25 | 28 |
| Japan | 1980 | 100 | 10 | 58 | 1 | 32 | 14 | 15 |
| Spain | 1979 | 100 | 11 | 69 | 1 | 19 | 15 | 15 |
| United Kingdom | 1980 | 100 | 22 | 60 | 2 | 18 | 28 | 26 |
| United States | 1979 | 100 | 17 | 64 | 1 | 19 | 9 | 10 |

Source: United States, Department of Commerce, Statistical Abstract, 1982–83, pp. 866–867, citing United Nations, Statistical Office, Monthly Bulletin of Statistics, July 1982.

Note.—In some instances, the percentage shares do not add to 100 because of varying treatment of import duties and other statistical items.

## TABLE 4.—COMPOSITION OF NATIONAL INCOME (NET MATERIAL PRODUCT) BY INDUSTRIAL ORIGIN, SELECTED YEARS, 1965–1981

[Percent of total]

| | Total | Industry | Agriculture and forestry | Construction | Transport and communications | Trade | Other |
|---|---|---|---|---|---|---|---|
| **Bulgaria:** | | | | | | | |
| 1965 [1] | 100 | 48.7 | 28.5 | 7.7 | 4.6 | 8.4 | 2.1 |
| 1965 [2] | 100 | 45.0 | 33.4 | 7.3 | 4.5 | 7.7 | 2.1 |
| 1970 [3] | 100 | 55.3 | 17.2 | 9.2 | 7.1 | 8.7 | 2.5 |

## TABLE 4.—COMPOSITION OF NATIONAL INCOME (NET MATERIAL PRODUCT) BY INDUSTRIAL ORIGIN, SELECTED YEARS, 1965–1981—Continued

[Percent of total]

| | Total | Industry | Agriculture and forestry | Construction | Transport and communications | Trade | Other |
|---|---|---|---|---|---|---|---|
| 1970 [2] | 100 | 49.1 | 22.6 | 8.7 | 6.9 | 9.9 | 2.8 |
| 1975 [3] | 100 | 53.5 | 19.0 | 8.9 | 8.3 | 8.0 | 2.3 |
| 1980 [3] | 100 | 57.0 | 11.2 | 8.6 | 8.2 | 11.8 | 3.2 |
| 1981 [3] | 100 | 47.8 | 19.2 | 9.4 | 8.2 | 12.7 | 2.7 |
| 1981 [2] | 100 | 47.6 | 19.5 | 9.4 | 8.2 | 12.6 | 2.7 |
| Czechoslovakia: | | | | | | | |
| 1965 [4] | 100 | 68.9 | 9.9 | 10.3 | 4.1 | 6.0 | 0.8 |
| 1965 [2] | 100 | 64.9 | 13.3 | 9.3 | 3.2 | 8.4 | 0.9 |
| 1970 [4] | 100 | 61.6 | 10.9 | 10.9 | 3.6 | 11.8 | 1.2 |
| 1970 [2] | 100 | 61.0 | 11.3 | 11.2 | 4.2 | 11.3 | 1.0 |
| 1975 [2] | 100 | 64.7 | 9.3 | 12.4 | 4.3 | 8.7 | 0.6 |
| 1975 [4] | 100 | 63.4 | 8.9 | 11.8 | 3.7 | 11.5 | 0.7 |
| 1975 [4] | 100 | 62.7 | 8.9 | 11.9 | 3.7 | 11.6 | 1.2 |
| 1980 [2] | 100 | 63.5 | 8.4 | 10.5 | 5.0 | 12.2 | 0.4 |
| 1980 [5] | 100 | 59.1 | 8.6 | 11.3 | 4.6 | 16.0 | 0.4 |
| 1981 [2] | 100 | 61.4 | 7.0 | 10.0 | 5.2 | 16.0 | 0.4 |
| 1981 [5] | 100 | 59.9 | 7.1 | 11.4 | 4.8 | 16.4 | 0.4 |
| GDR: | | | | | | | |
| 1965 [6] | 100 | 59.2 | 13.8 | 7.4 | 5.4 | 12.5 | 1.7 |
| 1965 [7] | 100 | 62.4 | 14.5 | 5.9 | 4.6 | 9.7 | 2.7 |
| 1970 [6] | 100 | 60.7 | 11.6 | 8.3 | 5.2 | 12.6 | 1.6 |
| 1970 [7] | 100 | 64.5 | 12.0 | 6.5 | 4.5 | 9.8 | 2.7 |
| 1975 [8] | 100 | 59.1 | 11.1 | 7.4 | 5.0 | 14.6 | 2.8 |
| 1975 [7] | 100 | 66.1 | 10.2 | 6.4 | 4.5 | 10.0 | 2.8 |
| 1980 [7] | 100 | 68.7 | 8.4 | 5.9 | 4.2 | 9.7 | 3.1 |
| 1981 [7] | 100 | 69.1 | 8.2 | 5.9 | 4.2 | 9.6 | 3.0 |
| Hungary: | | | | | | | |
| 1965 [9] | 100 | 66.9 | 16.4 | 10.7 | 4.5 | 0.6 | 0.9 |
| 1965 [10] | 100 | 41.6 | 24.0 | 10.6 | 6.0 | 13.5 | 4.3 |
| 1970 [2] | 100 | 42.3 | 17.4 | 12.3 | 6.1 | 15.2 | 6.7 |
| 1970 [10] | 100 | 42.4 | 17.5 | 11.9 | 6.4 | 14.8 | 7.0 |
| 1975 [2] | 100 | 48.2 | 16.4 | 12.3 | 7.4 | 14.9 | 0.8 |
| 1975 [12] | 100 | 45.7 | 18.8 | 12.5 | 8.1 | 14.4 | 0.5 |
| 1975 [11] | 100 | 46.2 | 17.9 | 11.1 | 5.8 | 17.3 | 1.7 |
| 1980 [12] | 100 | 44.2 | 18.6 | 12.4 | 9.4 | 14.3 | 1.1 |
| 1980 [11] | 100 | 50.8 | 16.0 | 10.8 | 5.5 | 15.3 | 1.6 |
| 1980 [2] | 100 | 36.3 | 14.6 | 10.3 | 7.8 | 11.9 | 19.1 |
| 1981 [12] | 100 | 44.7 | 18.0 | 12.3 | 9.5 | 14.5 | 1.0 |
| 1981 [11] | 100 | 49.2 | 14.8 | 10.9 | 5.4 | 18.5 | 1.2 |
| Poland: | | | | | | | |
| 1965 [13] | 100 | 53.4 | 21.1 | 9.0 | 6.2 | 8.5 | 1.8 |
| 1965 [14] | 100 | 45.0 | 25.5 | 10.2 | 6.3 | 11.5 | 1.5 |
| 1970 [13] | 100 | 58.4 | 14.8 | 10.0 | 6.4 | 8.6 | 1.5 |
| 1970 [15] | 100 | 44.0 | 24.9 | 11.7 | 6.3 | 11.8 | 1.3 |
| 1975 [2] | 100 | 59.5 | 14.8 | 11.2 | 6.8 | 5.5 | 2.2 |
| 1975 [15] | 100 | 47.5 | 17.1 | 13.6 | 7.5 | 12.7 | 1.6 |
| 1980 [15] | 100 | 50.9 | 14.2 | 10.0 | 8.7 | 14.0 | 2.2 |
| 1980 [2] | 100 | 52.3 | 15.8 | 9.9 | 7.2 | 12.8 | 2.0 |
| 1981 [15] | 100 | 48.7 | 16.9 | 7.9 | 9.0 | 15.0 | 2.5 |
| 1981 [2] | 100 | 42.2 | 29.6 | 7.0 | 6.6 | 12.6 | 2.0 |
| Romania: [16] | | | | | | | |
| 1965 | 100 | 48.9 | 28.9 | 8.0 | 4.0 | ........ | 10.2 [17] |
| 1970 | 100 | 60.3 | 19.5 | 9.8 | 4.0 | ........ | 6.4 [17] |
| 1970 | 100 | 58.0 | 18.5 | 10.4 | 6.0 | ........ | 7.1 [17] |
| 1975 | 100 | 56.2 | 16.0 | 7.6 | 5.8 | ........ | 14.4 [17] |
| 1975 | 100 | 59.8 | 16.2 | 7.6 | 5.8 | ........ | 10.6 [17] |
| 1975 [11] | 100 | 57.1 | 16.6 | 8.4 | 5.6 | 10.6 | 1.7 |
| 1980 | 100 | 58.6 | 14.1 | 8.8 | 7.0 | ........ | 11.5 [17] |

### TABLE 4.—COMPOSITION OF NATIONAL INCOME (NET MATERIAL PRODUCT) BY INDUSTRIAL ORIGIN, SELECTED YEARS, 1965–1981—Continued

[Percent of total]

| | Total | Industry | Agriculture and forestry | Construction | Transport and communications | Trade | Other |
|---|---|---|---|---|---|---|---|
| 1980 [11] | 100 | 59.3 | 15.2 | 9.3 | 7.0 | 7.4 | 1.8 |
| 1981 | 100 | 57.2 | 15.8 | 8.5 | 6.9 | ........ | 11.6[17] |
| 1981 [11] | 100 | 58.0 | 17.1 | 8.9 | 6.9 | 7.1 | 2.0 |

[1] In Jan. 1, 1962 prices (1965) and Jan. 1, 1971 prices (1975).

[2] In current prices.

[3] In 1981 prices.

[4] In Apr. 24, 1960 prices (1965) and Jan. 1, 1967 prices (1970, 1975).

[5] In Jan. 1, 1977 prices.

[6] In 1967 prices.

[7] In 1980 prices.

[8] In 1975 prices.

[9] In "comparable 1959 prices".

[10] In "comparable 1968 prices".

[11] Data published in the CMEA statistical yearbooks, presumably in comparable prices. "Agriculture and forestry" for Hungary cover only agriculture. Data for Romania cover both sectors.

[12] In "comparable 1976 prices" (1975) and "comparable 1981 prices" (1980–81).

[13] In 1961 prices".

[14] In 1971 prices".

[15] In 1977 prices".

[16] In current prices; the 2 sets of 1970 figures reflect changes in coverage to include passenger transportation and the communications services formerly excluded from national product, and also some services formerly excluded from industry and agriculture; the 2 sets of 1975 figures reflect changes in methodology from that effective in 1971–75 to the present methodology.

[17] Official breakdown is not available. According to tabulation provided by the CMEA statistical office for NMP in comparable prices, the share of trade was 7.5 percent in 1965, 3.5 percent in 1970, 10.6 percent in 1975, and 7.1 percent in 1981. The share of "Other" sector was 1.5 percent in 1965, 1.9 percent in 1970, 1.7 percent in 1975, and 2.0 percent in 1981. (See Statisticheski ezhegodnik stran-chlenov Soveta Ekonomicheskoi Vzaimopomoshchi, 1982, pp. 41, 42.)

It is worth repeating here our earlier observations that because of differences in concepts, in methodology, and especially in bases of valuation, the structures of economic activity as shown in GNP and NMP tables below are far from comparable. It would require a substantial effort to transform the NMP concepts into factor cost approximations such as are represented in our GNP tables. Some efforts have been made in Eastern Europe to see what consequences for structure of production would follow from application of different bases of valuation to the NMP concepts. The consequences were in fact very significant. We shall return to this point in discussing the NMP tables below. We believe our adjusted valuations shown in GNP concept provide a superior guide to the structure of production and use of product than the truncated production concept structures represented by the NMP tables and the distortions from factor cost entailed in the bases of valuation underlying these tables. For purposes of international comparison both within the CMEA grouping and with other countries, the GNP concept on an adjusted factor cost basis is preferred.

Table 2 shows the continued primacy of industry in the percentage composition of GNP, 1965–1982. This sector has shown a relatively stable share (around 40 percent) in Czechoslovakia and a modestly increasing share in the GDR (rising from around 41 percent to 45 percent), a small decline (from 34 to 31 percent) in Hungary, fluctuation around one-third of GNP in Poland, and steep increases in Bulgaria and Romania from 1965 to 1980, but leveling off in 1975–1982 to around 39 percent of GNP. The GNP share of agriculture and forestry has declined in most of the countries, 1965–1982, but the sector ranks second, ranging in 1982 from a low of about 13 percent in the GDR to a high of 27 percent in Poland. Hungary and Poland have kept a relatively stable share of agriculture in GNP (somewhat above one-fourth). We leave it to the reader to trace changes in GNP shares of the remaining sectors shown in Table 2.

Table 3, Part A shows in current prices for recent years the industrial composition of GDP for non-CMEA countries of Europe, the United States, and Japan. The Federal Republic of Germany in 1980 ranked first in the share of industry (40 percent), a share slightly below that of the GDR and about the some as for Czechoslovakia (see Table 2). At this juncture one should note that comparisons of this kind are extremely rough, and the shares in the various countries are strongly affected by the bases of valuation, sectoral boundaries, and methodolgy of calculation, which may differ among countries. Despite such differences, Table 3 suggests that Eastern Europe may be expected to decrease further the share of agriculture and to increase the share for services as the economies continue to develop. The very low shares for agriculture and forestry (2 to 4 percent) for the more developed countries shown in Table 3 (USA, UK, West Germany, France, Austria, and Japan) are unlikely to be reached in Eastern Europe in a short period.

The Table 4 shares of material product sectors in the NMP (net material product) national income are not directly comparable to data shown in Tables 2 and 3, not only because of the narrower product concept but also because of very signficantly different bases of valuation. This lack of comparability applies within Table 4 itself, both for a single country over time and among countries, primarily because of differences in relative valuation among sectors. Moreover, as we have already noted above, changes in coverage of the NMP concept also affect the comparisons. At various points in time all of the countries except Czechoslovakia have transferred passenger transportation and communications serving households and nonmaterial sectors of production from the nonmaterial to the material product sphere. In 1970 and 1971, Bulgaria and Romania made this transfer. There have also been other such transfers enlarging the material product sphere, and the footnotes and introductory text to the national income chapters of the national statistical yearbooks make clear the lack of comparability over time that these transfers cause. We have not attempted to adjust the published figures to achieve comparability over time, and indeed the task might well require more information than is given in the available statistical sources.

We show in Table 4 breakdowns of NMP by industrial sector for given years for several countries in more than one set of prices in order to illustrate the sometimes extreme shifts that changes in valuation bring about. The footnotes to the table indicate the price bases underlying these changes. Perhaps most striking are the instances of "deindustrialization" within a single year. In Bulgaria, for example, in 1970 industry accounted for 55.3 percent of NMP in 1981 prices, but only 49.1 percent in current prices. Most striking was the change in the share of industry in Hungary for 1965, from 66.9 to 41.6 percent in the transition from 1959 prices to 1968 prices. A similar instance is that of Poland for 1970: a decline from 58.4 to 44.0 percent, in 1961 and 1977 prices. These observations are not intended to be pejorative as regards official NMP statistics; rather they suggest the need for care in interpretation and in making comparisons intertemporally and internationally.

In addition to price base changes, there are four further aspects of NMP structure measures on which comments are warranted. First, the shares exhibited in the table are in market prices and reflect the incidence of turnover taxes, profits, and subsidies. These distortions from factor cost on balance favor industry, where the turnover taxes and profits, as forms of "socialist accumulation" (saving or revenue to finance investment and other social objectives) in general are realized in industrial selling prices. Second, because NMP national income excludes "nonproductive" services (government, etc.), but GNP does not, the percentage shares of net material product originating in the total NMP for industry and other material sectors would be larger than the correspondingly named gross value added shares in GNP, where allocations have to be made to the sectors excluded from NMP. The fact that GNP includes capital consumption allowances whereas NMP excludes them of course should be taken into account here, but the consequences of this consideration would have to be sorted out in terms of the distribution of fixed assets and depreciation rates. Third, the NMP concept refers to gross output less material costs; purchases from "nonmaterial" sectors appear as net material product of the buying sector. Although the total of such purchases is not large, if some sector, say industry, accounts for a disproportionate part of the total, then some distortion would follow as compared to the conventional notion of value added. Finally, fourth, and most important, the bases of valuation underlying Table 2 differ from those of Table 4; Table 2 represents approximations to factor cost; Table 4 is in established prices. The principal outcome of this difference would be more symmetric valuations in Table 2.

Economic statisticians in Eastern Europe are aware of the consequences that alternative bases of valuation have upon the structure of NMP. For example the Polish Central Statistical Office calculated the 1967 structure of gross material product (NMP plus depreciation) in three variants of approximation to factor cost. Whereas in realized prices industry accounted for 51 percent of the total and agriculture only 19 percent, in the variant reflecting returns to labor and capital somewhat along the lines we follow, the share for industry was 41 percent, and agriculture 27 percent.[4]

## COMPOSITION OF NATIONAL PRODUCT BY END USES

In Table 5 we show the percentage composition of gross product entering domestic final uses. The total here for each year comprises final product arising from domestic production plus imports minus exports. We shall not attempt a reconciliation of our independently derived indexes and sectoral shares of national product by origins and uses with official NMP measures because of differences in concepts, bases of valuation and other reasons. Even in instances where, as for Hungary, official statistics are available in

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[4] For a more detailed discussion, see my contribution to the JEC 1981 Compendium, East European Economic Assessment, part 2, pp. 361–364.

GDP concept, the other factors contributing to lack of comparability still remain. Comparisons based on simple juxtaposition of our measures with correspondingly named official measures are misleading.

TABLE 5.—COMPOSITION OF GROSS PRODUCT DOMESTICALLY USED, SELECTED YEARS, 1965–82

[In constant prices]

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| Bulgaria: | | | | | | |
| 1. Private consumption | 58.5 | 56.7 | 51.3 | 60.7 | 58.7 | 57.9 |
| a. Personal consumption excluding housing | 50.8 | 49.9 | 46.0 | 54.1 | 52.3 | 51.5 |
| b. Housing | 7.7 | 6.8 | 5.3 | 6.6 | 6.4 | 6.3 |
| 2. Government: Selected civilian elements | 8.3 | 8.0 | 9.8 | 11.9 | 11.5 | 11.5 |
| 3. Residual: Gross investment, defense, other | 33.2 | 35.3 | 38.9 | 27.4 | 29.8 | 30.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Czechoslovakia: | | | | | | |
| 1. Private consumption | 59.9 | 57.8 | 57.1 | 57.2 | 60.5 | 60.6 |
| a. Personal consumption excluding housing | 48.7 | 47.8 | 46.4 | 46.5 | 49.2 | 49.3 |
| b. Housing | 11.2 | 10.0 | 10.7 | 10.7 | 11.3 | 11.4 |
| 2. Government: Selected civilian elements | 8.8 | 8.8 | 9.5 | 9.9 | 10.8 | 10.9 |
| 3. Residual: Gross investment, defense, other | 31.3 | 33.4 | 33.5 | 32.9 | 28.7 | 28.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| German Democratic Republic: | | | | | | |
| 1. Private consumption | 66.6 | 62.8 | 59.0 | 59.1 | 59.9 | 59.9 |
| a. Personal consumption excluding housing | 56.4 | 53.9 | 49.3 | 50.0 | 50.6 | 50.6 |
| b. Housing | 10.2 | 8.9 | 9.7 | 9.1 | 9.3 | 9.3 |
| 2. Government: Selected civilian elements | 14.4 | 13.0 | 11.2 | 11.3 | 11.5 | 11.7 |
| 3. Residual: Gross investment, defense, other | 19.0 | 24.2 | 29.8 | 29.6 | 28.6 | 28.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Hungary: | | | | | | |
| 1. Private consumption | 56.1 | 56.8 | 53.5 | 56.6 | 58.2 | 59.8 |
| a. Personal consumption excluding housing | 45.3 | 47.2 | 42.3 | 44.9 | 46.2 | 47.4 |
| b. Housing | 10.8 | 9.6 | 11.2 | 11.7 | 12.0 | 12.5 |
| 2. Government: Selected civilian elements | 9.0 | 8.3 | 7.6 | 8.2 | 8.4 | 8.8 |
| 3. Residual: Gross investment, defense, other | 34.9 | 34.9 | 39.0 | 35.2 | 33.3 | 31.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Poland: | | | | | | |
| 1. Private consumption | 57.6 | 56.7 | 51.6 | 58.9 | 60.4 | 59.6 |
| a. Personal consumption excluding housing | 49.0 | 48.4 | 42.8 | 48.8 | 49.4 | 47.6 |
| b. Housing | 8.6 | 8.3 | 8.8 | 10.2 | 11.0 | 12.0 |
| 2. Government: Selected civilian elements | 8.3 | 7.8 | 7.3 | 8.1 | 8.9 | 9.7 |
| 3. Residual: Gross investment, defense, other | 34.1 | 35.5 | 41.1 | 33.0 | 30.8 | 30.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Romania: | | | | | | |
| 1. Private consumption | 58.5 | 56.2 | 52.1 | 54.0 | 54.7 | 53.4 |
| a. Personal consumption excluding housing | 50.9 | 49.6 | 46.7 | 49.0 | 49.7 | 48.4 |
| b. Housing | 7.6 | 6.6 | 5.4 | 5.0 | 5.1 | 5.0 |
| 2. Government: Selected civilian elements | 13.4 | 11.1 | 8.8 | 7.7 | 7.7 | 7.6 |
| 3. Residual: Gross investment, defense, other | 28.1 | 32.7 | 39.1 | 38.3 | 37.5 | 39.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Sources: Occasional Papers, Nos. 72 and 77.

Indexes corresponding to the structure shown in Table 5 are given in Table 14 for 1965, 1970, and 1975–1982, and are discussed in Section IV. We note briefly that Tables 5 and 14 are derived within the framework of our estimates of GNP produced. Indexes of personal consumption excluding housing are estimated from extensive commodity samples weighted by base-year prices and base-year consumption expenditures by major categories. Housing services are weighted by their sector of origin weights augmented by estimated purchases from other sectors for this final use. The selected elements of government final civilian uses comprise administration, justice, internal security, education, culture, health and social welfare. Their indexes are the same as in our GNP by sector of origin, but their weights are augmented by purchases from other sectors, comparably to the weight for housing. A residual consisting of gross investment, defense, and other uses not already covered in the private consumption and selected government final uses noted above is derived by subtracting the specified uses from the control total of product available for domestic final uses as defined above. Our Occasional Papers, Nos. 55, 57, 58, 61, and 77, among others, provide details of our sources, methodology, and findings.

We should note here that the results in Tables 5 and 14 are provisional and are not as detailed as we would like them to be. Our principal concern is to disaggregate the residual, but we are constrained by the knowledge that official sources indicate inclusion of some defense expenditure in the official accumulation, or investment, category. How the defense component as a final use would move over time is the major issue. Official defense expenditure data are believed to understate substantially the actual defense spending.

The shares of private consumption as presented in Table 5 generally show considerable stability from 1970 to 1982, comprising around 60 percent of gross product domestically used. Romania shows a smaller share, around 55 percent in this period. The indexes in Table 14 may be more informative. There is room for speculation as to what the trade-offs may be within the residual as between civilian investment and military procurement. Austerity with regard to civilian investment in the more recent years is noted in East European discussions. Table 5 indicates substantially declining shares for the residual, which includes civilian investment and defense outlays, in the more recent years, but Romania, whose statistics are the least satisfactory, appears to be an exception.

Table 6 shows the percentage composition of "distributed" NMP national income in Eastern Europe for selected years, 1965–81. The total distributed NMP differs from the total NMP produced by the extent of losses of product and the surplus (or deficit) of imports over exports. NMP national income here excludes nonmaterial services as contributors to production but includes them as users of material product. The NMP concept is not comparable to GNP or GDP, and differences in methodology and especially of bases of valuation, among other reasons, contribute further to lack of comparability.

Table 6 shows the structure of NMP in allocations to consumption and net accumulation (investment) and to components of these two major uses. Footnotes to the table indicate the price bases for particular rows. For most countries, as a percentage share, accumulation rose from 1965 to a peak in the mid-1970s. In the more recent years, consumer expectations combined with balance of payments problems and other factors retarding growth led to declining shares for accumulation. Romania obfuscates the picture by showing shares only as averages over the five-year periods. Trends in total consumption shares obviously complement the trend in accumulation. Because NMP is a smaller aggregate than GNP, use shares in NMP, other things being equal, obviously would be higher than in GNP.

TABLE 6.—COMPOSITION OF DISTRIBUTED NATIONAL INCOME (NET MATERIAL PRODUCT) BY FINAL USE, SELECTED YEARS, 1965–81

[Percent of total]

| | NMP used total | Consumption | | | Accumulation | | |
|---|---|---|---|---|---|---|---|
| | | Total | Personal | Collective | Total | Fixed capital | Inventory and reserves |
| Bulgaria: | | | | | | | |
| 1965[1] | 100 | 71.7 | 69.2 | 2.5 | 28.3 | NA | NA |
| 1970[1] | 100 | 69.2 | 66.3 | 2.9 | 30.8 | NA | NA |
| 1975[1] | 100 | 67.2 | 63.2 | 4.0 | 32.8 | NA | NA |
| 1975[2] | 100 | 67.5 | NA | NA | 32.5 | NA | NA |
| 1980[1] | 100 | 74.8 | 70.4 | 4.4 | 25.2 | NA | NA |
| 1981[1] | 100 | 73.1 | 69.3 | 3.8 | 26.9 | NA | NA |
| Czechoslovakia: | | | | | | | |
| 1965[2] | 100 | 90.9 | 70.2 | 20.7 | 9.1 | 9.2 | –.1 |
| 1970[3] | 100 | 76.7 | 57.9 | 18.8 | 23.3 | 18.3 | 5.0 |
| 1975[3] | 100 | 74.0 | 54.5 | 19.5 | 26.0 | 21.6 | 4.4 |
| 1975[2] | 100 | 71.4 | 52.4 | 19.0 | 28.6 | 24.3 | 5.3 |
| 1980[3] | 100 | 74.0 | 53.8 | 20.2 | 26.0 | 18.5 | 7.5 |
| 1981[3] | 100 | 80.0 | 57.8 | 22.2 | 20.0 | 17.0 | 3.0 |
| GDR: | | | | | | | |
| 1965[4] | 100 | 80.0 | 71.5 | 8.5 | 20.0 | 15.5 | 4.5 |
| 1965[5] | 100 | 78.8 | 68.7 | 10.1 | 21.2 | NA | NA |
| 1970[4] | 100 | 75.6 | 66.4 | 9.2 | 24.4 | 20.6 | 3.7 |
| 1970[5] | 100 | 74.4 | 63.5 | 10.9 | 25.6 | NA | NA |
| 1975[4] | 100 | 77.7 | 67.0 | 10.8 | 22.3 | 19.4 | 2.9 |
| 1975[5] | 100 | 76.6 | 63.9 | 12.7 | 23.4 | NA | NA |
| 1980[5] | 100 | 77.3 | 64.9 | 12.4 | 22.7 | NA | NA |
| 1981[5] | 100 | 78.3 | 65.7 | 12.6 | 21.7 | NA | NA |
| Hungary: | | | | | | | |
| 1965[6] | 100 | 76.1 | 72.3 | 3.8 | 23.9 | 20.0 | 3.9 |
| 1965[7] | 100 | 79.8 | 71.2 | 8.6 | 20.2 | 15.0 | 5.2 |
| 1970[6] | 100 | 76.0 | 66.6 | 9.4 | 24.0 | 18.8 | 5.2 |
| 1970[8] | 100 | 76.5 | 66.9 | 9.6 | 23.5 | 22.5 | 1.0 |
| 1975[8] | 100 | 73.6 | 64.1 | 9.5 | 26.4 | 23.8 | 2.6 |
| 1980[9] | 100 | 80.4 | NA | NA | 19.6 | 17.9 | 1.7 |
| 1980[8] | 100 | 78.2 | 66.7 | 11.5 | 21.8 | 20.0 | 1.8 |
| 1981[9] | 100 | 82.2 | NA | NA | 17.8 | 15.4 | 2.4 |
| 1981[8] | 100 | 80.0 | 68.1 | 11.9 | 20.0 | 17.0 | 3.0 |
| Poland: | | | | | | | |
| 1965[10] | 100 | 72.9 | 64.1 | 8.8 | 27.1 | 18.8 | 8.3 |
| 1970[11] | 100 | 71.9 | 61.4 | 10.5 | 28.1 | 22.0 | 6.1 |
| 1970[12] | 100 | 73.9 | 62.6 | 11.3 | 26.1 | 19.5 | 6.6 |
| 1970[12] | 100 | 72.9 | 61.7 | 11.2 | 27.1 | 20.5 | 6.6 |
| 1975[12] | 100 | 64.3 | 53.9 | 10.4 | 35.7 | 29.0 | 6.7 |
| 1980[12] | 100 | 79.7 | 66.3 | 13.4 | 20.3 | 17.3 | 3.0 |
| 1981[12] | 100 | 90.9 | 76.0 | 14.9 | 9.1 | 10.7 | –1.6 |
| 1981[2] | 100 | 90.0 | 77.6 | 12.4 | 10.0 | 9.9 | 0.1 |

TABLE 6.—COMPOSITION OF DISTRIBUTED NATIONAL INCOME (NET MATERIAL PRODUCT) BY FINAL USE, SELECTED YEARS, 1965–81—Continued

[Percent of total]

| | NMP used total | Consumption | | | Accumulation | | |
|---|---|---|---|---|---|---|---|
| | | Total | Personal | Collective | Total | Fixed capital | Inventory and reserves |
| Romania:[13] | | | | | | | |
| 1961–65 | 100 | 75.7 | NA | NA | 24.3 | NA | NA |
| 1966–70 | 100 | 71.2 | NA | NA | 28.8 | NA | NA |
| 1971–75 | 100 | 65.9 | NA | NA | 34.1 | NA | NA |
| 1976–80 | 100 | 63.7 | NA | NA | 36.5 | NA | NA |

[1] In comparable prices: prices of Jan. 1, 1962 through 1970; prices of Jan. 1, 1971 for 1975 and onward.
[2] In current prices.
[3] Prices of Jan. 1, 1967, for 1965–75; 1976–81 in Jan. 1, 1977 prices and in a revised classification.
[4] In 1975 prices.
[5] In 1980 prices.
[6] In comparable 1959 prices.
[7] In 1968 comparable prices, revised figures.
[8] In comparable 1976 prices.
[9] In comparable 1981 prices.
[10] In constant 1961prices.
[11] In constant 1971 prices.
[12] In constant prices of Jan. 1, 1977.
[13] In comparable prices: 1955 prices for the period 1961–65; 1963 prices for 1966–70 and 1971–75, and Jan. 1, 1977 prices for 1976–1980. More recent or more detailed data are not available.

## STRUCTURE AND GROWTH OF EMPLOYMENT

Table 7 provides insights into the evolving structure of production from the viewpoint of the distribution of the economically active population by industrial sectors for CMEA countries of Europe, other countries of Europe, and the USA.[5] Although these data are not fully comparable as to coverage, the orders of magnitude are probably close enough for rough orientation: (1) The economically active population in the East European countries and the USSR comprises around one-half of the total population. In Western Europe and the United States the range for the most recent years shown is roundly between 36 and 47 percent. For the USA it is 46.9 percent; the Federal Republic of Germany shows 43.4 percent; Spain (1979) is lowest at 35.7 percent, and United Kingdom highest at 47.1 percent. (2) As a percentage of the total economically active population, non-material services in Eastern Europe and the USSR have risen from a range of 8 to 15 percent in 1960 to a range of 12 to 20 percent in 1979–80. For the non-CMEA countries, the corresponding range for 1979–1980 was 20 to 39 percent. (3) The percentage shares for the East European countries for industry have risen markedly since 1960 for Bulgaria, Romania, Poland, and Hungary; very slight increases appeared in Czechoslovakia and the GDR.

For the CMEA region as a whole the range for the most recent years for the share of industry in the total economically active population was between 30 and 43 percent, with the GDR (43 percent) and Czechoslovakia (38 percent) at the top and Romania (36 percent) and Poland (30 percent) at the bottom. The 1979–80 corresponding range for industry in Western Europe was from 24 percent (Spain) to 36 percent (the Federal Republic of Germany); for the United States the share was 24 percent. Thus in terms of the range of industry's share in total employment, Eastern Europe is higher than Western Europe. The share of agriculture and forestry in Eastern Europe fell sharply in all countries since 1960, when the range was from a high of 66 percent in Romania to a low of 17 percent in the GDR. By 1980 this range had diminished to a high of around 30 percent in Romania and Poland and a low of 10 percent in the GDR. In Western Europe agriculture's share also declined sharply; in the most recent year shown, the range was from 17 percent (Spain, 1979) to 2.4 percent (United Kingdom, 1979); for the United States (1980) the percentage was 3.4. The comparison suggests that agriculture still affords a labor reserve for transfer to non-agricultural sectors in Eastern Europe. Such transfer will depend on improved productivity in agriculture and the provision of employment opportunities and housing in the non-agricultural sectors. Industry's share may be expected to decline as the services' share rises.

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[5] The CMEA classification is followed for Eastern Europe and the International Standard Industrial Classification for the remaining countries.

Table 8 provides for countries of Eastern Europe the percentage composition of employment and indexes of growth of employment by sectors of production, 1965, 1970, 1975, 1980, and 1981. The share for industry in the total employment showed only slight changes over the 1965–81 period for Czechoslovakia, the GDR, Hungary, and Poland; very substantial increases occurred in Bulgaria, and particularly in Romania (from 19 to 36 percent). In 1981 the range for the industrial shares for the six countries was from 30 percent (Poland) to 42 percent (the GDR), a remarkable reduction from the range in 1965, from 19 percent (in Romania) to 41 percent in the GDR. For agriculture and forestry the evolution of ranges was, from 1965, 58 percent in Romania to 16 percent in the GDR, to 1981, 30 percent in Romania to 10 percent in the GDR. In the present economic environment, reductions below the 10 percent level appear difficult to achieve.

The indexes in Table 8 show the growth of employment totals and by sector, 1965–1981. Total employment increased most in Poland (29 percent) and least in Romania, Hungary, and the GDR (around 7 to 8 percent). Employment in most sectors grew faster than total employment with the outstanding exception of agriculture and forestry, where it dropped, in percent, by about 43 in Romania, 42 in Bulgaria, 30 in the GDR, 24 in Hungary and 23 in Czechoslovakia, and 4 in Poland. The two-fold increase in Romanian employment in industry, 1965–1981, is striking.

Because industry is the largest sector in all countries, except Poland, where its employment share is nearly the same as for agriculture, the changing composition of employment by branches of socialized industry, 1965–1981, shown in Table 9, may be of interest. Private industry is relatively insignificant in Eastern Europe. In all countries, in socialized industry, the machinery branch, comprising metals, general machinery, precision machinery, transport means, and electric-electronic equipment is the largest branch and has increased its share over the period. In 1965 its share ranged from 20 percent (Bulgaria) to 38 percent (GDR). By 1981, this range had diminished to 27 percent (Bulgaria) and 43 percent (GDR). In all of the countries, textiles' share was important at the beginning of the period (9 to 11 percent), but this share subsequently declined to 1981 (7 to 9 percent), except in Romania where it increases slightly (from 10 to 12 percent of the total). The chemicals branch shows fairly consistent growth over this period throughout the area.

TABLE 7.—ECONOMICALLY ACTIVE POPULATION BY KIND OF ACTIVITY, SELECTED COUNTRIES AND YEARS

| | Total (thousands) | Percent of total population | Percentages of active population in— | | | |
|---|---|---|---|---|---|---|
| | | | Nonmaterial services | Industry | Agriculture and forestry | Other material activities |
| Bulgaria: | | | | | | |
| 1960 | NA | NA | 9.2 | 21.9 | 55.5 | 13.6 |
| 1965 | 4,268 | 51.9 | 13.0 | 30.4 | 35.8 | 20.8 |
| 1975 | 4,448 | 51.0 | 17.0 | 35.0 | 24.5 | 23.5 |
| Czechoslovakia: | | | | | | |
| 1960 | 6,063 | 44.4 | 14.3 | 37.3 | 25.9 | 22.5 |
| 1970 | 6,943 | 48.4 | 18.0 | 38.4 | 18.5 | 25.1 |
| 1980 | 7,455 | 48.7 | 20.0 | 37.9 | 14.2 | 27.9 |
| GDR: | | | | | | |
| 1960 | 7,968 | 46.2 | 15.3 | 42.0 | 17.3 | 25.4 |
| 1970 | 8,167 | 47.9 | 19.0 | 42.1 | 13.0 | 25.9 |
| 1980 | 8,683 | 51.9 | 19.0 | 43.2 | 10.5 | 27.3 |
| Hungary: | | | | | | |
| 1960 | 4,876 | 49.0 | 14.3 | 28.4 | 38.9 | 18.4 |
| 1970 | 4,980 | 48.1 | 15.0 | 35.9 | 26.4 | 22.7 |
| 1980 | 5,074 | 47.4 | 19.0 | 33.4 | 22.0 | 25.6 |
| Poland: | | | | | | |
| 1960 | 13,971 | 47.5 | 13.1 | 23.2 | 48.0 | 15.7 |
| 1970 | 16,944 | 51.9 | 15.0 | 27.6 | 38.6 | 18.8 |
| 1978 | 17,962 | 51.2 | 16.0 | 29.7 | 30.2 | 24.1 |
| Romania: | | | | | | |
| 1960 | 9,583 | 51.6 | 7.6 | 15.1 | 65.6 | 11.7 |
| 1970 | 9,875 | 48.8 | 10.0 | 23.0 | 49.3 | 17.7 |
| 1980 | 10,350 | 46.6 | 12.0 | 35.5 | 29.8 | 22.7 |
| USSR: | | | | | | |
| 1960 | 99,130 | 47.5 | 15.4 | 32.3 | 38.7 | 13.6 |
| 1970 | 117,028 | 48.4 | 15.0 | 29.3 | 25.4 | 30.3 |
| 1979 | 134,860 | 51.4 | 19.0 | 29.5 | 20.2 | 31.3 |
| Austria: | | | | | | |
| 1961 | 3,370 | 47.6 | 19.4 | 31.1 | 22.8 | 26.7 |
| 1971 | 3,098 | 41.5 | 20.0 | 33.3 | 13.8 | 32.9 |
| 1980 | 3,105 | 41.3 | 25.0 | 31.6 | 10.4 | 33.0 |
| France: | | | | | | |
| 1962 | 19,829 | 42.7 | 24.0 | 29.4 | 19.8 | 26.8 |
| 1968 | 20,641 | 41.4 | 25.0 | 27.8 | 15.1 | 32.1 |
| 1980 | 22,949 | 42.7 | 33.0 | 25.1 | 8.2 | 33.7 |
| Spain: | | | | | | |
| 1960 | 11,634 | 38.1 | 14.9 | 24.3 | 41.3 | 19.5 |
| 1970 | 11,908 | 32.3 | 18.0 | 27.3 | 24.8 | 29.9 |
| 1979 | 13,302 | 35.7 | 20.0 | 24.2 | 17.4 | 38.4 |
| West Germany: | | | | | | |
| 1961 | 25,763 | 47.7 | 23.0 | 40.0 | 13.4 | 23.6 |
| 1970 | 25,810 | 44.1 | 24.0 | 39.9 | 7.5 | 28.6 |
| 1980 | 25,880 | 43.4 | 29.0 | 36.3 | 5.7 | 29.0 |
| United Kingdom: | | | | | | |
| 1961 | 24,617 | 46.7 | 27.7 | 39.3 | 3.8 | 29.2 |
| 1971 | 25,021 | 45.0 | 30.0 | 35.6 | 2.5 | 31.9 |
| 1979 | 26,369 | 47.1 | 35.0 | 30.2 | 2.4 | 32.4 |

## TABLE 7.—ECONOMICALLY ACTIVE POPULATION BY KIND OF ACTIVITY, SELECTED COUNTRIES AND YEARS—Continued

|  | Total (thousands) | Percent of total population | Percentages of active population in— |  |  |  |
|---|---|---|---|---|---|---|
|  |  |  | Non-material services | Industry | Agriculture and forestry | Other material activities |
| Italy: |  |  |  |  |  |  |
| 1961 | 20,173 | 39.8 | 16.4 | 27.8 | 28.3 | 27.5 |
| 1971 | 19,806 | 36.7 | 20.0 | 32.0 | 16.4 | 31.6 |
| 1980 | 22,804 | 40.2 | 23.0 | 25.1 | 12.8 | 39.1 |
| United States: |  |  |  |  |  |  |
| 1960 | 69,877 | 39.0 | 31.6 | 28.8 | 6.5 | 33.1 |
| 1970 | 85,903 | 42.1 | 31.0 | 27.5 | 4.3 | 37.2 |
| 1980 | 106,821 | 46.9 | 39.0 | 24.3 | 3.4 | 33.3 |

Source: Rocznik statystyczny 1976, p. 554; ibid., 1982, pp. 500–501.

## TABLE 8.—STRUCTURE AND GROWTH OF EMPLOYMENT BY MAJOR SECTOR, SELECTED YEARS

[Percent of total; indexes 1975 = 100]

| | Structure (percent) | | | | | | Indexes (1975 = 100) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975A | 1975B | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Bulgaria: | | | | | | | | | | | |
| Industry (including handicrafts) | 26.3 | 30.4 | 33.5 | 33.5 | 35.2 | 35.7 | 72.0 | 87.5 | 100 | 106.7 | 109.4 |
| Agriculture and forestry | 45.3 | 35.7 | 28.1 | 28.1 | 24.2 | 23.5 | 147.7 | 122.9 | 100 | 87.1 | 85.6 |
| Construction | 7.0 | 8.4 | 8.0 | 8.0 | 8.2 | 8.2 | 79.6 | 101.3 | 100 | 104.1 | 105.2 |
| Transport and communications | 5.1 | 6.0 | 6.4 | 6.4 | 6.8 | 6.8 | 76.2 | 88.4 | 100 | 109.6 | 110.7 |
| Trade | 5.2 | 6.1 | 7.8 | 7.8 | 8.0 | 8.1 | 60.5 | 70.5 | 100 | 104.2 | 106.5 |
| Other | 11.1 | 13.4 | 16.2 | 16.2 | 17.6 | 17.7 | 62.1 | 80.2 | 100 | 110.3 | 112.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 91.6 | 96.4 | 100 | 101.5 | 102.6 |
| Czechoslovakia: | | | | | | | | | | | |
| Industry (including handicrafts) | 38.3 | 38.0 | 38.5 | 31.5 | 30.5 | 30.4 | 86.7 | 93.4 | 100 | 102.5 | 103.1 |
| Agriculture and forestry | 21.1 | 18.3 | 15.2 | 13.0 | 11.5 | 11.5 | 121.1 | 114.0 | 100 | 93.6 | 93.6 |
| Construction | 8.0 | 8.6 | 9.3 | 8.0 | 8.0 | 7.8 | 75.6 | 87.8 | 100 | 105.5 | 104.0 |
| Transport and communications | 6.5 | 6.8 | 6.5 | 5.5 | 5.4 | 5.4 | 86.0 | 98.4 | 100 | 104.3 | 105.3 |
| Trade | 8.4 | 9.0 | 10.3 | 8.2 | 8.5 | 8.4 | 71.4 | 83.1 | 100 | 108.8 | 109.5 |
| Other | 17.7 | 19.3 | 20.2 | 33.8 | 36.1 | 36.5 | 76.0 | 90.0 | 100 | 112.9 | 115.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 87.1 | 94.6 | 100 | 105.7 | 106.6 |
| GDR: | | | | | | | | | | | |
| Industry (including handicrafts) | 41.4 | 42.1 | 42.0 | 42.0 | 41.8 | 41.8 | 94.7 | 98.1 | 100 | 103.1 | 103.7 |
| Agriculture and forestry | 16.1 | 12.4 | 11.0 | 11.0 | 10.5 | 10.4 | 141.0 | 110.9 | 100 | 98.8 | 99.1 |
| Construction | 6.1 | 8.0 | 7.5 | 7.5 | 7.0 | 7.4 | 78.1 | 104.6 | 100 | 97.1 | 103.7 |
| Transport and communications | 7.1 | 7.2 | 7.6 | 7.6 | 7.5 | 7.5 | 89.9 | 93.0 | 100 | 102.3 | 102.3 |
| Trade | 11.5 | 10.9 | 10.6 | 10.6 | 10.3 | 10.3 | 104.0 | 100.5 | 100 | 101.0 | 100.8 |
| Other | 17.8 | 19.4 | 21.3 | 21.3 | 22.9 | 22.6 | 80.3 | 88.7 | 100 | 111.7 | 110.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 96.1 | 97.8 | 100 | 103.7 | 104.3 |
| Hungary: | | | | | | | | | | | |
| Industry (including handicrafts) | 34.3 | 35.7 | 35.4 | 35.4 | 33.2 | 32.7 | 88.9 | 99.0 | 100 | 93.0 | 90.8 |
| Agriculture and foresty | 28.3 | 24.8 | 21.0 | 21.8 | 20.5 | 20.8 | 123.0 | 115.9 | 100 | 93.5 | 94.1 |
| Construction | 6.4 | 7.5 | 8.2 | 8.8 | 7.9 | 7.7 | 71.3 | 89.3 | 100 | 89.2 | 87.0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Transport and communications | 6.9 | 7.3 | 7.8 | 7.8 | 8.0 | 7.9 | 81.0 | 92.1 | 100 | 102.0 | 100.5 |
| Trade | 7.3 | 8.2 | 9.1 | 9.1 | 9.7 | 9.8 | 74.0 | 89.1 | 100 | 105.4 | 105.8 |
| Other | 16.8 | 16.5 | 18.5 | 17.2 | 20.7 | 21.0 | 83.1 | 87.6 | 100 | 119.3 | 120.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 91.5 | 98.1 | 100 | 99.1 | 98.4 |
| Poland: | | | | | | | | | | | |
| Industry (including handicrafts) | 28.6 | 30.3 | 31.1 | 30.4 | 30.4 | 30.2 | 72.7 | 86.5 | 100 | 101.8 | 101.7 |
| Agriculture and forestry | 39.4 | 34.6 | 30.8 | 31.8 | 30.3 | 30.3 | 101.4 | 100.2 | 100 | 97.3 | 97.6 |
| Construction | 6.8 | 7.3 | 8.7 | 8.3 | 7.7 | 7.5 | 62.0 | 75.1 | 100 | 95.1 | 92.0 |
| Transport and communications | 5.9 | 6.2 | 6.3 | 6.2 | 6.5 | 6.4 | 73.5 | 87.4 | 100 | 105.9 | 104.8 |
| Trade | 6.1 | 6.9 | 7.4 | 7.2 | 7.6 | 7.8 | 64.9 | 82.1 | 100 | 106.8 | 111.0 |
| Other | 13.2 | 14.7 | 15.7 | 16.1 | 17.5 | 17.7 | 67.0 | 83.3 | 100 | 110.7 | 112.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 79.2 | 89.0 | 100 | 101.9 | 102.2 |
| Romania: | | | | | | | | | | | |
| Industry (including handicrafts) | 18.8 | 22.5 | 30.1 | 30.1 | 35.1 | 35.8 | 59.5 | 72.9 | 100 | 119.2 | 121.9 |
| Agriculture and forestry | 57.6 | 50.3 | 39.1 | 38.1 | 30.4 | 29.6 | 140.6 | 125.6 | 100 | 81.6 | 79.5 |
| Construction | 6.4 | 7.6 | 8.1 | 8.1 | 8.7 | 8.0 | 75.5 | 91.6 | 100 | 109.4 | 101.0 |
| Transport and communications | 3.5 | 4.1 | 4.7 | 4.8 | 6.2 | 7.0 | 71.2 | 83.8 | 100 | 132.2 | 150.6 |
| Trade | 3.9 | 4.3 | 5.5 | 5.4 | 6.0 | 6.0 | 68.7 | 77.3 | 100 | 113.1 | 112.7 |
| Other | 9.8 | 11.2 | 12.5 | 13.4 | 13.6 | 13.6 | 73.9 | 87.8 | 100 | 103.3 | 104.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 95.3 | 97.6 | 100 | 102.2 | 102.5 |

Note.—For 1975 structure data are presented in two versions. 1975A figures reflect employment data according to official measures and classifications effective to 1975 or 1976 (depending on country), 1975B those effective since 1975 or 1976. Indexes are linked at 1975. The 1965–1975A figures were taken from my contribution to the 1981 JEC Compendium: East European Economic Assessment, and do not reflect official revisions in more recent sources. The Romanian and Bulgarian data in this table are not described in official sources as full man-year equivalents.

## TABLE 9.—STRUCTURE OF EMPLOYMENT BY BRANCHES OF SOCIALIZED INDUSTRY, SELECTED YEARS, 1965–81

[Annual averages and percentage composition]

| | Bulgaria | | | | | Czechoslovakia [1] | | | | | German Democratic Republic [1] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Employment: | | | | | | | | | | | | | | | |
| Thousands | 936.4 | 1,147.7 | 1,285.0 | 1,350.6 | 1,373.2 | 2,478.0 | 2,616.0 | 2,689.0 | 2,785.0 | 2,795.0 | 2,729.9 | 2,817.8 | 3,063.7 | 3,153.4 | 3,171.4 |
| Percent of total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1. Electric power | 1.6 | 1.5 | 1.5 | 1.9 | 2.0 | 1.7 | 1.7 | 1.9 | 1.9 | 2.1 | | | | | |
| 2. Mining and fuels | 5.6 | 5.0 | 4.0 | 3.2 | 3.3 | 8.3 | 6.5 | 6.3 | 6.4 | 6.4 | 9.5 | 6.2 | 6.4 | 6.7 | 6.8 |
| 3. Metallurgy | [2] 6.8 | [2] 5.9 | [2] 2.4 | [2] 2.6 | [2] 2.5 | 9.1 | 8.9 | 8.9 | 7.6 | 7.6 | 4.1 | 4.3 | 4.1 | 4.2 | 4.3 |
| 4. Machinery | 19.8 | 22.5 | 25.7 | 27.0 | 26.8 | 35.8 | 37.3 | 37.7 | 39.9 | 40.0 | 38.0 | 41.6 | 42.5 | 43.1 | 43.3 |
| 5. Chemicals and rubber | 4.1 | 5.3 | 6.1 | 6.3 | 6.5 | 4.5 | 5.0 | 5.2 | 5.2 | 5.2 | 10.3 | 11.5 | 10.9 | 10.8 | 10.7 |
| 6. Building materials | 5.0 | 4.2 | 4.6 | 4.6 | 4.7 | 3.9 | 4.0 | 3.9 | 3.9 | 3.1 | 3.2 | 3.2 | 3.1 | 3.0 | 3.0 |
| 7. Lumber and wood products | 8.8 | 7.3 | 6.4 | 5.4 | 5.3 | 4.8 | 4.8 | 4.9 | 4.6 | 4.6 | 5.3 | NA | NA | NA | NA |
| 8. Paper and paper products | 1.0 | 1.0 | 1.2 | 1.3 | 1.4 | 1.7 | 1.6 | 1.7 | 1.7 | 1.8 | 2.1 | NA | NA | NA | NA |
| 9. Textiles | 10.0 | 10.0 | 10.1 | 9.4 | 9.4 | 9.0 | 8.7 | 8.4 | 8.0 | 7.9 | 10.3 | 8.8 | 8.0 | 7.2 | 7.1 |
| 10. Other industry | 21.3 | 22.1 | 24.5 | 25.6 | 25.5 | 13.6 | 13.9 | 13.6 | 13.1 | 13.0 | 9.9 | [3] 16.7 | [3] 17.1 | [3] 16.3 | [3] 16.2 |
| 11. Food processing and tobacco | 16.0 | 15.2 | 13.5 | 12.7 | 12.6 | 7.6 | 7.6 | 7.5 | 7.5 | 7.5 | 7.3 | 7.7 | 7.9 | 8.7 | 8.7 |

| | Hungary | | | | | Poland | | | | | Romania | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | [4] 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Employment: | | | | | | | | | | | | | | | |
| Thousands | 1,498.1 | 1,729.0 | 1,744.0 | 1,614.0 | 1,578.0 | 3,431.5 | 4,043.6 | 4,704.1 | 4,741.2 | 4,716.5 | 1,675.6 | 2,066.0 | 2,802.1 | 3,329.2 | 3.397.1 |
| Percent of total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1. Electric power | 2.7 | 2.0 | 2.2 | 2.2 | 2.2 | 2.1 | 2.2 | 1.8 | 1.8 | 1.9 | 2.1 | 1.9 | 1.5 | 1.3 | 1.3 |
| 2. Mining and fuels | 10.4 | 8.4 | 7.2 | 7.1 | 7.2 | 11.1 | 9.9 | 8.9 | 9.7 | 9.9 | 5.8 | 4.7 | 3.6 | 3.7 | 3.7 |
| 3. Metallurgy | 6.1 | 5.8 | 6.0 | 6.0 | 5.9 | 5.8 | 5.6 | 5.4 | 5.5 | 5.3 | 7.3 | 6.8 | 6.1 | 6.3 | 6.5 |
| 4. Machinery | 29.4 | 31.0 | 31.6 | 32.0 | 32.0 | 28.2 | 31.0 | 32.8 | 34.3 | 33.8 | 24.2 | 26.4 | 32.6 | 35.6 | 35.7 |
| 5. Chemicals and rubber | 5.7 | 6.4 | 6.8 | 6.9 | 6.9 | 6.6 | 6.8 | 7.1 | 6.9 | 6.9 | 5.4 | 6.5 | 6.8 | 6.7 | 6.8 |
| 6. Building materials | 5.0 | 4.7 | 4.8 | 4.9 | 4.8 | 5.2 | 4.9 | 4.3 | 3.8 | 3.7 | 5.5 | 5.3 | 4.3 | 4.3 | 4.4 |
| 7. Lumber and wood products | 3.8 | 3.1 | 3.2 | 3.0 | 3.0 | 5.0 | 4.8 | 4.7 | 4.4 | 4.3 | 16.1 | 14.2 | 11.2 | 9.5 | 9.4 |
| 8. Paper and paper products | .8 | 1.0 | 1.0 | .9 | .9 | 1.4 | 1.3 | 1.3 | 1.1 | 1.1 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10. Other industry | 17.0 | 18.8 | 17.9 | 17.4 | 17.3 | 11.1 | 11.3 | 12.1 | 12.1 | 12.6 | 12.6 | 13.5 | 13.6 | 13.1 | 12.9 |
| 11. Food processing and tobacco | 9.7 | 10.4 | 11.4 | 12.2 | 12.4 | 12.1 | 11.5 | 11.4 | 11.1 | 11.4 | 9.1 | 8.5 | 7.7 | 6.8 | 6.4 |

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[1] Structure shares refer to production workers and employees in state industry only.

[2] 1965, and 1970: Ferrous and nonferrous industries: 1975 and onward: ferrous industry only. One might note the sharp increase in 1975 in "Other industry"; this suggests a transfer from "Metallurgy" to the "Other" category, which includes an unspecified residual we placed there.

[3] Including lumber and paper industries.

[4] The structure shown here is based on Polish revised industrial classification effective Jan. 1, 1976. Total employment for 1975 was revised upward by 1.3 percent, but relatively unimportant differences in percentage structure were entailed as compared with that based on the superseded classification. See RS 1977, p. 132 for details.

Note.—1965–1975 figures were taken from my contribution to the 1981 JEC Compendium and may not reflect later official revisions.

### STRUCTURE AND GROWTH OF FIXED CAPITAL

Priorities in fixed capital formation are reflected in Table 10 in terms of shares in total fixed capital and indexes showing growth of fixed capital for selected years, 1965–1981. Housing is a special case; its capital represents accumulation over a longer period than the material production sector. In 1965 housing capital was a large share in all countries, but it also generally shows lower rates of growth than the material production sectors over the period. In all six countries the share of industry is the largest in the national totals in 1981 and this share in most cases had increased over the 1965–1981 period, although it leveled off in the more recent periods. Among the material production sectors, transport and communications ranks second in 1981 in all countries except Poland, where agriculture and forestry comes second. Agriculture, with the exception noted above, ranked third. The range for the share of industry in 1981 in percentages of the total was from a high of 44 percent in Romania and the GDR to a low of 28 percent in Hungary.

The capital stock indexes in Table 10 are not comparable among countries because of valuation differences, which are most prominent for Bulgaria and Romania, which appear to show the series in current prices, and the other four countries, where various comparable prices and linkages are manifested in the indexes. For this latter group, the growth over 1965–81 was from 1.9-fold (GDR) up to 2.4-fold for Poland. The indicated growth for Bulgaria and Romania over this period—around 4-fold—may reflect their current price valuations. The indexes show fixed capital growing most rapidly in the 1965–81 period in construction in all countries; the ranking of other sectors in regard to growth varied among countries.

## III. Rates of Growth of GNP and Final Uses of Product

In Tables 11–17 we show our estimated real GNP indexes and the official NMP national income indexes covering the 1965–82 period of selected years within it. Corresponding average annual growth rates are presented in Tables 18–21. The indexes provide more detail than the least squares determined compound growth rates; the latter can be readily calculated from the indexes for any subperiod the reader may desire. Some comparable data on rates of growth are also presented for non-CMEA countries.

TABLE 10.—OFFICIAL DATA ON THE STRUCTURE AND GROWTH OF FIXED CAPITAL, BY MAJOR SECTOR, 1965, 1970, 1975, 1980, AND 1981

[Annual average unless otherwise specified; varying valuations as indicated]

| | Structure (percent) | | | | | Indexes (1975=100) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Bulgaria: Undepreciated fixed capital at "full initial cost"; cumulative value of assets at current prices of the time of acquisition: Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 45 | 68 | 100 | 161 | 173 |
| Industry | 27.4 | 33.1 | 36.1 | 35.7 | 36.3 | 33 | 63 | 100 | 160 | 174 |
| Agriculture | 14.5 | 13.3 | 12.5 | 11.2 | 11.0 | 51 | 73 | 100 | 144 | 152 |
| Construction | 1.3 | 1.9 | 2.4 | 2.7 | 2.6 | 24 | 54 | 100 | 182 | 192 |

## TABLE 10.—OFFICIAL DATA ON THE STRUCTURE AND GROWTH OF FIXED CAPITAL, BY MAJOR SECTOR, 1965, 1970, 1975, 1980, AND 1981—Continued

[Annual average unless otherwise specified; varying valuations as indicated]

| | Structure (percent) | | | | | Indexes (1975=100) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Transport and communication | 14.8 | 13.5 | 13.6 | 15.2 | 15.2 | 48 | 68 | 100 | 180 | 193 |
| Trade | 1.8 | 2.2 | 2.6 | 2.9 | 2.9 | 31 | 59 | 100 | 188 | 198 |
| Other material production | .1 | .1 | .2 | .3 | .3 | 21 | 28 | 100 | 316 | 289 |
| Subtotal: Material production | 59.9 | 64.0 | 67.4 | 68.1 | 68.3 | 39 | 65 | 100 | 163 | 175 |
| Nonproductive sectors | 40.1 | 36.0 | 32.6 | 31.9 | 31.7 | 58 | 75 | 100 | 157 | 168 |
| Of which, housing | 31.5 | 24.1 | 20.2 | 18.0 | 17.9 | 68 | 81 | 100 | 143 | 153 |
| Czechoslovakia (at undepreciated purchase value, in comparable 1967 prices, 1965–75, and in Jan. 1, 1977 prices for 1976–81; indexes linked at 1975): | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 64 | 77 | 100 | 131 | 139 |
| Industry | 33.0 | 34.6 | 35.0 | 34.7 | 34.9 | 60 | 76 | 100 | 135 | 143 |
| Agriculture and forestry | 8.2 | 8.8 | 9.0 | 9.5 | 9.5 | 58 | 75 | 100 | 137 | 146 |
| Construction | 1.3 | 1.9 | 2.3 | 2.7 | 2.7 | 36 | 64 | 100 | 153 | 165 |
| Transport and communication | 18.8 | 17.7 | 16.4 | 15.5 | 15.4 | 73 | 83 | 100 | 124 | 130 |
| Trade | 2.8 | 3.3 | 3.8 | 4.1 | 4.1 | 47 | 67 | 100 | 141 | 149 |
| Other material production | .1 | .1 | .1 | .1 | .1 | 54 | 75 | 100 | 129 | 130 |
| Subtotal: Material production | 64.3 | 66.5 | 66.7 | 66.5 | 66.7 | 61 | 77 | 100 | 134 | 141 |
| Nonproductive sectors | 35.7 | 33.5 | 33.3 | 33.5 | 33.3 | 68 | 78 | 100 | 128 | 134 |
| Of which, housing | 24.0 | 22.6 | 22.0 | 21.3 | 21.0 | 69 | 79 | 100 | 122 | 127 |
| GDR: Fixed capital at full (undepreciated) replacement value in 1966 comparable prices: | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 68 | 81 | 100 | 124 | 130 |
| Industry | 33.7 | 36.4 | 40.1 | 43.0 | 43.5 | 57 | 74 | 100 | 133 | 141 |
| Agriculture and forestry | 7.2 | 8.0 | 8.3 | 8.6 | 8.7 | 59 | 78 | 100 | 129 | 135 |
| Construction | 1.1 | 1.6 | 1.8 | 2.2 | 2.2 | 43 | 70 | 100 | 146 | 158 |
| Transport and communication | 10.2 | 9.7 | 9.7 | 9.7 | 9.7 | 72 | 81 | 100 | 124 | 129 |
| Trade | 2.9 | 3.0 | 3.2 | 3.5 | 3.5 | 60 | 76 | 100 | 134 | 142 |
| Other material production | .2 | .3 | .4 | .4 | .6 | 32 | 56 | 100 | 140 | 168 |
| Subtotal: Material production | 55.4 | 59.1 | 63.6 | 67.4 | 68.2 | 59 | 75 | 100 | 132 | 139 |
| Nonproductive sectors | 44.6 | 40.9 | 36.4 | 32.6 | 31.8 | 83 | 91 | 100 | 111 | 113 |
| Of which, housing | NA | NA | NA | NA | NA | NA | NA | 100 | NA | NA |
| Hungary: Fixed capital at full replacement value in constant prices of 1968 for 1960–75 and in 1976 prices for 1975–81: | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 58 | 73 | 100 | 133 | 138 |
| Industry | 22.5 | 25.0 | 24.8 | 27.2 | 27.6 | 48 | 68 | 100 | 146 | 154 |
| Agriculture and forestry | 8.4 | 9.7 | 12.3 | 12.2 | 12.2 | 42 | 60 | 100 | 132 | 137 |
| Construction | .7 | 1.0 | 1.3 | 1.8 | 1.9 | 29 | 51 | 100 | 175 | 190 |
| Transport and communication | 18.0 | 16.8 | 16.8 | 15.2 | 15.0 | 70 | 83 | 100 | 120 | 123 |
| Trade | 1.5 | 1.9 | 2.2 | 2.6 | 2.6 | 37 | 60 | 100 | 158 | 166 |
| Other material production | 5.3 | 4.8 | 5.5 | 5.4 | 5.4 | 63 | 71 | 100 | 132 | 137 |
| Subtotal: Material production | 56.4 | 59.2 | 62.9 | 64.5 | 64.8 | 52 | 69 | 100 | 136 | 142 |
| Nonproductive sectors | 43.6 | 40.8 | 37.1 | 35.5 | 35.2 | 68 | 80 | 100 | 127 | 131 |
| Of which, housing | 32.4 | 29.2 | 27.2 | 25.8 | 25.6 | 71 | 81 | 100 | 133 | 137 |
| Poland: Fixed capital at full replacement value in constant prices [1] | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 61 | 76 | 100 | 140 | 146 |

## TABLE 10.—OFFICIAL DATA ON THE STRUCTURE AND GROWTH OF FIXED CAPITAL, BY MAJOR SECTOR, 1965, 1970, 1975, 1980, AND 1981—Continued

[Annual average unless otherwise specified; varying valuations as indicated]

| | Structure (percent) | | | | | Indexes (1975=100) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981[1] |
| Industry | 22.0 | 23.6 | 28.5 | 30.1 | 30.1 | 43 | 63 | 100 | 156 | 162 |
| Agriculture and forestry | 16.6 | 16.5 | 15.9 | 16.6 | 16.7 | 66 | 80 | 100 | 140 | 147 |
| Construction | 1.3 | 1.6 | 2.2 | 3.1 | 3.1 | 31 | 55 | 100 | 181 | 188 |
| Transport and communication | 11.1 | 10.0 | 10.5 | 9.8 | 9.7 | 58 | 73 | 100 | 140 | 145 |
| Trade | 1.8 | 2.1 | 1.9 | 1.9 | 1.9 | 56 | 84 | 100 | 137 | 143 |
| Other material production | 1.3 | 2.0 | 2.6 | 3.9 | 4.0 | 45 | 59 | 100 | 166 | 179 |
| Subtotal: Material production | 54.1 | 55.8 | 61.6 | 65.3 | 65.5 | 52 | 69 | 100 | 153 | 160 |
| Nonproductive sectors | 45.9 | 44.2 | 38.4 | 34.7 | 34.5 | 75 | 88 | 100 | 117 | 121 |
| Of which, housing | 30.4 | 29.4 | 25.9 | 25.5 | 25.3 | 76 | 87 | 100 | 121 | 125 |
| Romania: Undepreciated fixed capital "at complete inventory prices" | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 42 | 63 | 100 | 155 | 168 |
| Industry | 31.8 | 37.4 | 41.3 | 43.6 | 43.9 | 29 | 54 | 100 | 163 | 178 |
| Agriculture | 13.5 | 12.6 | 11.4 | 10.7 | 10.6 | 47 | 64 | 100 | 144 | 156 |
| Construction | 2.4 | 2.7 | 3.5 | 4.4 | 4.3 | 29 | 50 | 100 | 193 | 209 |
| Transport and communication | 7.5 | 8.9 | 12.5 | 13.4 | 13.5 | 43 | 64 | 100 | 166 | 181 |
| Trade | 2.2 | 3.1 | 3.4 | 3.7 | 3.8 | NA | NA | 100 | NA | NA |
| Other material production | .2 | .4 | | | | NA | NA | 100 | NA | NA |
| Subtotal: Material production | 57.7 | 65.1 | 72.1 | 75.8 | 76.1 | 34 | 57 | 100 | 163 | 177 |
| Nonproductive sectors | 42.3 | 34.9 | 27.9 | 24.2 | 23.9 | 61 | 79 | 100 | 134 | 143 |
| Of which, housing | 25.2 | 21.6 | 19.7 | 17.4 | 17.3 | 62 | 70 | 100 | 136 | 146 |

[1] 1965-70 in 1960 constant prices; 1970-75 in 1971 constant prices; 1975-81 in 1977 constant prices, linked at 1970 and 1976.

### INDEXES OF NATIONAL PRODUCT

Our GNP indexes are calculated as aggregations of indexes of sectors of origin of product in constant prices. Weights for the aggregation of sectors into the overall GNP index are factor cost approximations of the sectoral shares in selected base years, generally in the late 1960s for the indexes up to 1975, and in the 1975-77 period for the indexes, 1975-82. The two spans were linked at 1975. These weights comprise returns to labor, a net return to the current value of fixed and working capital, a return to agricultural land, and depreciation of fixed capital.

The NMP national income measures represent sectoral gross output less material cost, including depreciation. Nonmaterial services are excluded from the NMP measure, although the sales of such services to the material sectors appear as part of the net material product of the purchasing sector. The NMP indexes were calculated for successive subperiods in sets of new constant, or comparable, prices for each such subperiod, and the subperiod indexes were chain linked into the index for the entire period. Because the GNP and the NMP national income indexes differ in concept, methodology, and weight regimens, they are not directly comparable.

The official NMP measures were taken directly from the national statistical publications. We made no effort to compensate for reclassification of economic activities; such changes in sectoral boundaries are often indicated in footnotes and introductory texts to the national income chapters of the national statistical yearbooks. However, retrospective changes in the published indexes often are not made. In the 1965–75 period Bulgaria and Romania added passenger transportation and communications serving nonmaterial sectors to the material product sphere; Czechoslovakia so far remains the only country among the six that has not made this change.

The setting of "constant" prices for new products is a source of upward bias in the official indexes. New industrial products have been given initially high "constant" prices with the intention to replace them later by new, low "constant" prices when the scale of production increases. East European discussions have indicated that such intentions were not adequately carried out because of adverse effects on bonuses to management related to plan fulfillment in constant prices. Moreover, some spurious innovations masking an essentially unchanged product are used by enterprises to set higher "constant" prices.

We have followed a consistent approach in constructing independent GNP indexes for the East European countries, taking as our basis product samples and other real output indicators from official country statistical publications. Details of our methodology and sources are published in our series of Occasional Papers.

Tables 11 and 12 present our indexes of overall and per capita real GNP, respectively. Table 12 shows slower growth where the population is increasing (the GDR is the exception here, with declining population). In the 1965–82 period Romania was highest in growth of total GNP (121 percent), followed by Bulgaria (79 percent). The remaining four countries were clustered (54 to 60 percent). The range of growth of GNP per capita is narrower, from 87 percent (Romania) to 36 percent (Poland). GNP growth in Poland has been negative since 1978, and growth in the other five countries has slowed significantly in the more recent years.

Table 13 shows the detailed array of our sectoral real GNP indexes, 1965–82, and the weights used to combine them into overall GNP, 1975–82. The indexes, 1965–75 were combined by weights drawn from the late 1960s, and the time segments were linked at 1975. Agriculture in all countries grows less rapidly over the 1965–82 period than overall GNP and industry. The heavily weighted industry and agriculture indexes are decisive in the growth of overall GNP.

TABLE 11.—INDEXES OF REAL GNP, 1965–82

[Indexes 1975 = 100]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|
| 1965 | 62.1 | 71.6 | 72.3 | 73.2 | 60.0 | 56.8 |
| 1966 | 67.0 | 74.7 | 74.5 | 77.4 | 63.8 | 63.3 |
| 1967 | 70.6 | 77.9 | 76.9 | 81.8 | 66.1 | 66.2 |
| 1968 | 71.9 | 81.5 | 80.4 | 82.8 | 70.1 | 67.6 |
| 1969 | 75.4 | 83.0 | 82.3 | 85.3 | 69.4 | 70.7 |
| 1970 | 79.7 | 84.7 | 84.4 | 85.0 | 73.0 | 72.3 |

## TABLE 11.—INDEXES OF REAL GNP, 1965–82—Continued

[Indexes 1975 = 100]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|
| 1971 | 82.3 | 87.6 | 86.3 | 88.8 | 78.2 | 82.5 |
| 1972 | 86.2 | 90.7 | 89.2 | 90.7 | 83.9 | 87.8 |
| 1973 | 89.6 | 93.7 | 92.0 | 95.4 | 90.2 | 90.6 |
| 1974 | 92.4 | 97.1 | 96.4 | 97.9 | 95.5 | 95.7 |
| 1975 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1976 | 103.0 | 101.7 | 102.0 | 100.3 | 102.5 | 110.8 |
| 1977 | 102.0 | 106.0 | 105.1 | 106.6 | 104.4 | 113.7 |
| 1978 | 104.2 | 107.8 | 106.9 | 109.2 | 108.1 | 119.0 |
| 1979 | 108.2 | 108.8 | 109.9 | 109.5 | 106.2 | 123.4 |
| 1980 | 104.8 | 111.1 | 112.3 | 110.5 | 103.6 | 121.4 |
| 1981 | 107.9 | 109.9 | 115.0 | 110.9 | 98.0 | 122.1 |
| 1982 | 110.9 | 110.4 | 115.6 | 112.8 | 94.1 | 125.4 |

Source: Table 13.

## TABLE 12.—INDEXES OF REAL GNP PER CAPITA, 1965–82

[Indexes 1975 = 100]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|
| 1965 | 66.0 | 74.8 | 71.6 | 75.9 | 64.8 | 63.4 |
| 1966 | 70.8 | 77.6 | 73.6 | 80.1 | 68.5 | 70.3 |
| 1967 | 74.1 | 80.6 | 75.8 | 84.2 | 70.4 | 72.9 |
| 1968 | 74.9 | 83.9 | 79.3 | 84.9 | 73.8 | 72.8 |
| 1969 | 78.0 | 85.2 | 81.2 | 87.2 | 72.6 | 75.0 |
| 1970 | 81.8 | 87.5 | 83.4 | 86.6 | 76.4 | 75.9 |
| 1971 | 84.1 | 90.0 | 85.2 | 90.2 | 81.2 | 85.6 |
| 1972 | 87.7 | 92.9 | 88.2 | 91.9 | 86.4 | 90.2 |
| 1973 | 90.6 | 95.3 | 91.3 | 96.4 | 91.9 | 92.5 |
| 1974 | 92.8 | 97.9 | 96.0 | 98.4 | 96.4 | 96.7 |
| 1975 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1976 | 102.6 | 100.9 | 102.4 | 99.8 | 101.5 | 109.8 |
| 1977 | 101.0 | 104.4 | 105.6 | 105.6 | 102.4 | 111.5 |
| 1978 | 103.1 | 105.4 | 107.5 | 107.8 | 105.1 | 115.7 |
| 1979 | 106.9 | 105.6 | 110.6 | 107.8 | 102.5 | 118.9 |
| 1980 | 103.1 | 107.4 | 113.1 | 108.7 | 99.1 | 116.2 |
| 1981 | 105.8 | 106.2 | 115.8 | 109.0 | 92.9 | 116.1 |
| 1982 | 108.5 | 106.3 | 116.4 | 111.0 | 88.4 | 118.6 |

Sources: Tables 1 and 11.

## TABLE 13.—INDEXES OF REAL GNP BY SECTOR OF ORIGIN, EAST EUROPEAN COUNTRIES, 1965, 1970, AND 1975–82

[Indexes 1975 = 100; weights in percent of GNP]

| | Weights | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulgaria: | | | | | | | | | | | |
| GNP | 100.0 | 62.1 | 79.7 | 100.0 | 103.0 | 102.0 | 104.2 | 108.2 | 104.8 | 107.9 | 110.9 |
| Industry | 35.06 | 50.2 | 75.7 | 100.0 | 102.9 | 106.9 | 110.7 | 114.6 | 117.3 | 120.3 | 123.9 |
| Agriculture and Forestry | 27.64 | 88.3 | 90.1 | 100.0 | 102.1 | 91.9 | 92.6 | 101.1 | 84.1 | 88.2 | 92.1 |
| Construction | 6.68 | 53.1 | 87.1 | 100.0 | 99.0 | 103.1 | 110.4 | 109.4 | 106.1 | 105.9 | 106.0 |
| Transportation and Communications | 8.13 | 39.2 | 68.5 | 100.0 | 110.0 | 111.9 | 115.0 | 116.1 | 118.1 | 123.8 | 126.3 |
| Trade | 7.18 | 45.5 | 68.8 | 100.0 | 103.9 | 103.6 | 105.5 | 106.7 | 106.2 | 108.0 | 111.3 |
| Housing | 4.44 | 74.2 | 82.5 | 100.0 | 102.6 | 105.5 | 108.0 | 110.4 | 113.1 | 115.8 | 118.6 |
| Government and other | 10.87 | 65.5 | 79.7 | 100.0 | 102.6 | 101.0 | 98.3 | 99.0 | 102.1 | 103.5 | 105.3 |

## TABLE 13.—INDEXES OF REAL GNP BY SECTOR OF ORIGIN, EAST EUROPEAN COUNTRIES, 1965, 1970, AND 1975–82—Continued

[Indexes 1975 = 100; weights in percent of GNP]

| | Weights | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Czechoslovakia: | | | | | | | | | | | |
| GNP | 100.00 | 71.6 | 84.7 | 100.0 | 101.7 | 106.0 | 107.8 | 108.8 | 111.1 | 109.9 | 110.4 |
| Industry | 38.61 | 67.4 | 82.7 | 100.0 | 103.9 | 107.4 | 110.2 | 112.0 | 114.1 | 115.5 | 116.1 |
| Agriculture and Forestry | 16.87 | 76.5 | 89.1 | 100.0 | 95.6 | 107.4 | 104.5 | 102.1 | 107.9 | 95.0 | 96.0 |
| Construction | 8.92 | 70.2 | 82.5 | 100.0 | 102.9 | 104.4 | 106.4 | 107.0 | 108.0 | 107.8 | 106.2 |
| Transportation and Communications | 7.86 | 74.0 | 83.2 | 100.0 | 104.3 | 107.7 | 112.0 | 115.1 | 116.7 | 117.9 | 116.5 |
| Trade | 8.86 | 56.3 | 76.3 | 100.0 | 101.7 | 104.8 | 107.7 | 107.9 | 107.4 | 108.4 | 109.1 |
| Housing | 9.37 | 88.7 | 92.7 | 100.0 | 101.5 | 103.0 | 104.5 | 105.8 | 107.2 | 108.4 | 109.6 |
| Government and other | 9.51 | 80.6 | 90.8 | 100.0 | 100.5 | 102.8 | 105.2 | 107.7 | 110.2 | 111.9 | 113.2 |
| German Democratic Republic: | | | | | | | | | | | |
| GNP | 100.00 | 72.3 | 84.4 | 100.0 | 102.0 | 105.1 | 106.9 | 109.9 | 112.3 | 115.0 | 115.6 |
| Industry | 42.82 | 70.0 | 84.7 | 100.0 | 103.9 | 106.1 | 109.0 | 112.6 | 115.8 | 120.1 | 122.7 |
| Agriculture and Forestry | 14.63 | 85.3 | 87.0 | 100.0 | 91.7 | 100.4 | 98.4 | 103.6 | 104.4 | 107.0 | 100.7 |
| Construction | 5.24 | 55.6 | 79.5 | 100.0 | 104.9 | 109.4 | 112.0 | 113.4 | 114.6 | 112.5 | 115.8 |
| Transportation and Communications | 8.19 | 61.7 | 77.2 | 100.0 | 105.5 | 107.2 | 108.6 | 110.5 | 112.8 | 111.9 | 109.0 |
| Trade | 8.51 | 62.8 | 78.1 | 100.0 | 103.5 | 104.7 | 107.4 | 109.1 | 111.3 | 112.8 | 113.5 |
| Housing | 8.76 | 90.8 | 94.6 | 100.0 | 100.8 | 101.6 | 102.4 | 103.3 | 104.2 | 105.2 | 106.1 |
| Government and other | 11.85 | 79.4 | 87.4 | 100.0 | 104.2 | 106.4 | 109.1 | 111.6 | 115.0 | 118.3 | 121.7 |
| Hungary: | | | | | | | | | | | |
| GNP | 100.00 | 73.2 | 85.0 | 100.0 | 100.3 | 106.6 | 109.2 | 109.5 | 110.5 | 110.9 | 112.8 |
| Industry | 32.37 | 74.0 | 87.9 | 100.0 | 103.3 | 108.1 | 112.0 | 113.1 | 111.4 | 111.5 | 112.3 |
| Agriculture and Forestry | 23.88 | 82.0 | 82.6 | 100.0 | 93.8 | 106.0 | 105.0 | 102.1 | 108.3 | 107.5 | 112.8 |
| Construction | 7.53 | 58.1 | 84.6 | 100.0 | 101.5 | 104.8 | 109.6 | 107.3 | 102.2 | 99.3 | 98.0 |
| Transportation and Communications | 8.25 | 72.0 | 85.3 | 100.0 | 102.7 | 111.1 | 117.4 | 120.8 | 121.3 | 124.3 | 123.9 |
| Trade | 7.04 | 49.1 | 73.3 | 100.0 | 100.6 | 106.5 | 110.5 | 112.1 | 112.6 | 115.2 | 116.2 |
| Housing | 10.63 | 86.1 | 90.7 | 100.0 | 102.1 | 104.2 | 106.1 | 108.0 | 110.0 | 111.8 | 113.5 |
| Government and other | 10.30 | 69.3 | 85.4 | 100.0 | 102.9 | 103.9 | 106.4 | 109.1 | 110.2 | 111.6 | 113.4 |
| Poland: | | | | | | | | | | | |
| GNP | 100.00 | 60.0 | 73.0 | 100.0 | 102.5 | 104.4 | 108.1 | 106.2 | 103.6 | 98.0 | 94.1 |
| Industry | 33.92 | 51.3 | 69.4 | 100.0 | 101.7 | 103.5 | 105.5 | 104.4 | 102.8 | 89.7 | 86.1 |
| Agriculture and Forestry | 26.24 | 95.1 | 94.4 | 100.0 | 101.6 | 102.2 | 110.5 | 104.3 | 95.4 | 99.5 | 96.0 |
| Construction | 7.91 | 40.5 | 58.6 | 100.0 | 105.6 | 105.2 | 104.7 | 99.8 | 95.4 | 80.3 | 77.1 |
| Transportation and Communications | 7.91 | 40.6 | 55.1 | 100.0 | 107.1 | 113.1 | 119.1 | 118.6 | 121.0 | 104.2 | 94.2 |
| Trade | 6.26 | 48.3 | 63.6 | 100.0 | 104.1 | 107.5 | 107.7 | 108.1 | 107.7 | 100.8 | 85.9 |
| Housing | 8.61 | 74.1 | 87.3 | 100.0 | 102.9 | 106.0 | 108.7 | 111.4 | 114.4 | 116.9 | 119.1 |
| Government and other | 9.84 | 71.8 | 81.8 | 100.0 | 101.1 | 103.3 | 105.2 | 107.8 | 110.0 | [illegible] | 112.7 |
| Romania: | | | | | | | | | | | |
| GNP | 100.00 | 56.8 | 72.3 | 100.0 | 110.8 | 113.7 | 119.0 | 123.4 | 121.4 | 122.1 | 125.4 |
| Industry | 38.14 | 37.6 | 64.5 | 100.0 | 106.2 | 111.5 | 116.5 | 120.2 | 124.0 | 123.8 | 124.9 |
| Agriculture and Forestry | 27.90 | 81.5 | 77.2 | 100.0 | 125.2 | 122.8 | 128.5 | 131.7 | 117.2 | 117.6 | 126.8 |
| Construction | 7.23 | 61.5 | 87.7 | 100.0 | 108.4 | 113.4 | 119.7 | 128.4 | 123.5 | 117.7 | 115.8 |
| Transportation and Communications | 6.26 | 39.2 | 64.4 | 100.0 | 103.7 | 107.2 | 112.4 | 119.5 | 121.7 | 122.8 | 125.9 |
| Trade | 7.47 | 45.2 | 67.4 | 100.0 | 106.0 | 113.6 | 122.8 | 130.7 | 138.0 | 141.9 | 142.0 |
| Housing | 3.83 | 74.1 | 87.3 | 100.0 | 102.9 | 106.0 | 108.7 | 111.4 | 114.4 | 116.9 | 119.1 |
| Government and other | 9.17 | 71.8 | 81.8 | 100.0 | 101.1 | 103.3 | 105.2 | 107.8 | 110.0 | 113.0 | 112.7 |

Sources: OP–75, tables 1–6.

## TABLE 14.—INDEXES OF REAL FINAL DOMESTIC USES OF GROSS PRODUCT, 1965, 1970, AND 1975–82

[In constant prices, 1975 = 100]

| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bulgaria: | | | | | | | | | | |
| Private consumption | 67.8 | 82.9 | 100.0 | 103.9 | 103.8 | 105.6 | 107.5 | 108.3 | 110.6 | 112.0 |
| Personal consumption excluding housing | 66.9 | 83.0 | 100.0 | 104.0 | 103.6 | 105.3 | 107.2 | 107.8 | 110.0 | 111.2 |
| Housing | 74.2 | 82.5 | 100.0 | 102.6 | 105.5 | 108.0 | 110.4 | 113.1 | 115.8 | 118.6 |
| Government: Selected civilian elements | 63.2 | 77.3 | 100.0 | 104.5 | 104.9 | 105.8 | 107.1 | 111.1 | 113.3 | 116.0 |
| Residual: Gross investment, defense, other | 51.3 | 69.0 | 100.0 | 89.7 | 85.5 | 77.1 | 76.8 | 64.5 | 74.0 | 78.3 |
| Total | 60.9 | 77.0 | 100.0 | 98.4 | 96.8 | 94.5 | 95.6 | 91.6 | 96.6 | 99.3 |
| Czechoslovakia: | | | | | | | | | | |
| Private consumption | 77.6 | 87.7 | 100.0 | 102.1 | 105.0 | 107.9 | 107.7 | 107.9 | 109.3 | 109.9 |
| Personal consumption excluding housing | 75.5 | 86.6 | 100.0 | 102.3 | 105.5 | 108.7 | 108.2 | 108.1 | 109.5 | 110.0 |
| Housing | 88.7 | 92.7 | 100.0 | 101.5 | 103.0 | 104.5 | 105.8 | 107.2 | 108.4 | 109.6 |
| Government: Selected civilian elements | 73.8 | 86.0 | 100.0 | 102.0 | 105.1 | 107.7 | 110.7 | 113.1 | 117.8 | 119.5 |
| Residual: Gross investment, defense, other | 62.0 | 77.3 | 100.0 | 105.1 | 106.4 | 103.0 | 100.7 | 105.8 | 88.5 | 88.0 |
| Total | 71.6 | 83.7 | 100.0 | 103.1 | 105.5 | 106.2 | 105.7 | 107.7 | 103.1 | 103.5 |
| German Democratic Republic: | | | | | | | | | | |
| Private consumption | 73.5 | 82.6 | 100.0 | 103.4 | 104.4 | 106.7 | 108.8 | 110.6 | 111.7 | 112.6 |
| Personal consumption excluding housing | 71.1 | 81.0 | 100.0 | 103.9 | 105.0 | 107.6 | 109.9 | 111.8 | 113.0 | 113.9 |
| Housing | 90.8 | 94.6 | 100.0 | 100.8 | 101.6 | 102.4 | 103.3 | 104.2 | 105.2 | 106.1 |
| Government: Selected civilian elements | 83.0 | 89.1 | 100.0 | 104.1 | 106.0 | 107.9 | 110.0 | 111.5 | 113.7 | 115.9 |
| Residual: Gross investment, defense, other | 63.9 | 97.1 | 100.0 | 103.8 | 110.4 | 104.8 | 103.8 | 109.5 | 105.6 | 106.1 |
| Total | 72.6 | 86.6 | 100.0 | 103.6 | 106.4 | 106.3 | 107.5 | 110.4 | 110.1 | 111.0 |
| Hungary: | | | | | | | | | | |
| Private consumption | 70.8 | 85.1 | 100.0 | 101.0 | 105.1 | 108.2 | 109.7 | 111.3 | 113.2 | 114.0 |
| Personal consumption excluding housing | 67.9 | 84.0 | 100.0 | 100.7 | 105.3 | 108.8 | 110.2 | 111.7 | 113.6 | 114.1 |
| Housing | 86.1 | 90.7 | 100.0 | 102.1 | 104.2 | 106.1 | 108.0 | 110.0 | 111.8 | 113.5 |
| Government: Selected civilian elements | 76.3 | 84.4 | 100.0 | 103.7 | 105.8 | 108.3 | 111.5 | 113.7 | 116.3 | 118.9 |
| Residual: Gross investment, defense, other | 76.5 | 90.7 | 100.0 | 95.6 | 102.3 | 115.9 | 97.6 | 95.1 | 89.0 | 82.1 |
| Total | 73.2 | 87.0 | 100.0 | 99.1 | 104.0 | 111.2 | 105.2 | 105.2 | 104.0 | 101.9 |
| Poland: | | | | | | | | | | |
| Private consumption | 63.5 | 76.4 | 100.0 | 105.6 | 109.7 | 109.9 | 111.3 | 112.5 | 108.8 | 100.2 |
| Personal consumption excluding housing | 62.0 | 74.8 | 100.0 | 106.2 | 110.4 | 110.1 | 111.3 | 112.1 | 107.1 | 96.3 |
| Housing | 74.1 | 87.3 | 100.0 | 102.9 | 106.0 | 108.7 | 111.4 | 114.4 | 116.9 | 119.1 |
| Government: Selected civilian elements | 75.4 | 86.3 | 100.0 | 102.0 | 103.8 | 105.3 | 107.7 | 109.3 | 112.8 | 115.4 |
| Residual: Gross investment, defense, other | 42.4 | 53.9 | 100.0 | 98.7 | 93.0 | 96.3 | 86.8 | 79.0 | 69.6 | 64.6 |
| Total | 55.0 | 67.1 | 100.0 | 102.5 | 102.4 | 104.0 | 101.0 | 98.5 | 93.0 | 86.7 |
| Romania: | | | | | | | | | | |
| Private consumption | 63.7 | 78.0 | 100.0 | 106.3 | 111.5 | 117.0 | 122.6 | 125.9 | 128.3 | 128.6 |
| Personal consumption excluding housing | 61.8 | 76.7 | 100.0 | 106.8 | 112.3 | 118.2 | 124.1 | 127.4 | 129.8 | 129.8 |
| Housing | 80.3 | 89.2 | 100.0 | 102.3 | 104.5 | 106.9 | 109.6 | 112.6 | 115.3 | 117.8 |
| Government: Selected civilian elements | 86.0 | 90.8 | 100.0 | 103.4 | 102.5 | 102.0 | 105.3 | 106.3 | 106.6 | 108.1 |
| Residual: Gross investment, defense, other | 40.6 | 60.3 | 100.0 | 118.4 | 119.2 | 125.5 | 128.5 | 118.8 | 117.3 | 125.1 |
| Total | 56.8 | 72.3 | 100.0 | 110.8 | 113.7 | 119.0 | 123.4 | 121.4 | 122.1 | 125.4 |

Sources: OP-77, tables 1-6.

Table 14 presents provisional indexes of real final domestic uses of gross product. The total product here is GNP produced plus imports minus exports and losses. Indexes of private personal consumption were calculated using official weights for consumption categories provisionally as substitutes for a factor cost weights. Product series were available in national statistical yearbooks, and unit prices were taken from the same base year as our sector of origin GNP indexes. In some few instances where physical product series and price weights were unavailable we use official value series in their constant prices. The housing index carries a weight comprising its weight in our sector of origin GNP indexes plus estimated purchases by housing services from other sectors. An analogous weighting procedure was used for the selected government civilian service component indexes: (1) administration, justice, and internal security, (2) education and culture, and (3) health and social welfare. The total product less the independent estimates private and government consumption yield the residual series, comprising gross investment, defense expenditures, other items of government consumption not already accounted, and statistical discrepancy. Our Occasional Papers provide details of our estimates.

Major interest here concerns the content of the "Residual": what part of it is gross investment and what part is military procurement? At this stage we have not provided a breakdown. To the extent that the military component has more or less the same growth rate as civilian gross investment, the index of the residual could serve as a proxy for an investment index (subject of course to reservations noted above). In the most recent years under the pressure to meet consumer expectations, the burden of external debt service, and the related foreign trade difficulties, civilian investment goals have been sharply reduced in some countries. East European official definitions of "accumulation" (net investment) indicate that some defense procurements are within the accumulation category.

Private consumption shows steady growth over the 1965–82 period, except in Poland in the most recent years. Housing, measured as an available space index, shows continuous growth over the entire period. The indicated government service indexes reflect the continued growth of employment in the component government sectors. The residual index generally has grown rapidly, 1965–75, but thereafter its growth has slackened, and it even has fallen below the 1975 level in all countries except the GDR and Romania. Because of its residual nature, inferences based on this index should be made with caution.

Table 15 presents the official overall NMP sectoral and national income produced indexes. The indexes shown for particular sectors over the 1965–81 period show faster growth for construction, trade, industry, and transport and communications, in varying order depending on the country. Agriculture shows below average growth in all countries. Our GNP indexs over the 1965–82 period (Table 13) show markedly slower growth than the official NMP national income produced indexes (Table 15). The measures, however, are not comparable because of different production boundaries, pricing and other weightings, and methodology. We believe that for international comparisons both within the CMEA area and with non-

CMEA countries, the GNP series provide a more consistent base than the NMP indexes, which are sometimes used as proxies for GNP growth. Comparisons of growth rates, GNP versus NMP, are ill-advised; these rates are separately shown in Tables 18–21.

The official overall real NMP national income produced indexes per capita are given in Table 16. They are all lower than the corresponding total indexes because of population growth, except for the GDR, which experienced an absolute decline of population.

We have discussed above in connection with Table 14 indexes of real final domestic uses of gross product, defined as GNP plus imports minus exports and losses. Table 17 presents for all countries except Romania (which does not publish this information) the official indexes of total and per capita net material product (NMP) domestically distributed and also indexes for consumption and accumulation (net capital formation), 1965, 1970, 1975, 1980, and 1981. NMP produced is here adjusted by "losses" and the foreign trade balance to arrive at the total distributed. Once more, we emphasize that because of differences in concepts of GNP versus NMP, prices and other weights, and methodology, Tables 14 and 17 are not comparable. Services entering the GNP as origins of product, enter the NMP produced as value added of the material sector that buys them, and these services appear as final users of the NMP, to the extent of their purchases of material product, under the heading of consumption. In GNP concept these nonmaterial services enter in full under gross value added in production and in their contribution to final uses.

TABLE 15.—INDEXES OF NET MATERIAL PRODUCT BY SECTOR OF ORIGIN, EAST EUROPEAN COUNTRIES, 1965, 1970, AND 1975–81

[In constant prices, 1975 = 100]

| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|---|---|---|---|
| Bulgaria: [1] | | | | | | | | | |
| NMP | 45.1 | 68.6 | 100.0 | 106.5 | 113.2 | 119.5 | 127.4 | 134.7 | 141.4 |
| Industry | 35.6 | 64.2 | 100.0 | 107.2 | 117.8 | 131.3 | 138.3 | 138.8 | 147.2 |
| Agriculture and forestry | 96.8 | 92.4 | 100.0 | 101.6 | 87.9 | 88.0 | 97.0 | 77.1 | 80.5 |
| Construction | 41.0 | 73.1 | 100.0 | 100.6 | 112.1 | 116.1 | 119.7 | 124.8 | 135.1 |
| Transportation and communications | 36.4 | 58.8 | 100.0 | 109.4 | 114.7 | 122.3 | 127.1 | 130.0 | 142.9 |
| Trade | 29.7 | 49.1 | 100.0 | 113.0 | 136.8 | 98.8 | 119.5 | 275.4 | 270.1 |
| Other | 89.4 | 90.1 | 100.0 | 119.3 | 124.5 | 127.3 | 142.4 | 180.1 | 180.3 |
| Czechoslovakia: | | | | | | | | | |
| NMP | 54.2 | 75.8 | 100.0 | 104.2 | 108.5 | 113.0 | 116.4 | 119.8 | 119.4 |
| Industry | 55.1 | 74.4 | 100.0 | 105.1 | 106.8 | 111.7 | 115.6 | 118.5 | 119.8 |
| Agriculture and forestry | 67.2 | 93.0 | 100.0 | 94.2 | 107.2 | 101.8 | 97.6 | 104.0 | 85.8 |
| Construction | 48.4 | 69.1 | 100.0 | 104.0 | 101.0 | 104.2 | 105.6 | 109.7 | 110.3 |
| Transportation and communications | 65.7 | 73.0 | 100.0 | 103.6 | 111.9 | 122.1 | 126.1 | 129.5 | 133.8 |
| Trade | 40.6 | 77.2 | 100.0 | 103.8 | 119.9 | 128.5 | 136.6 | 140.6 | 143.2 |
| Other | 37.7 | 82.9 | 100.0 | 94.6 | 88.7 | 91.7 | 102.8 | 79.1 | 75.5 |
| German Democratic Republic: | | | | | | | | | |
| NMP | 59.8 | 77.3 | 100.0 | 103.7 | 109.0 | 113.1 | 117.6 | 122.7 | 128.8 |
| Industry | 56.9 | 75.5 | 100.0 | 105.8 | 110.5 | 115.6 | 121.0 | 127.6 | 134.7 |
| Agriculture and forestry | 82.7 | 89.8 | 100.0 | 88.8 | 99.1 | 95.9 | 100.9 | 100.6 | 103.4 |
| Construction | 55.2 | 80.0 | 100.0 | 105.4 | 110.0 | 112.5 | 111.8 | 114.2 | 120.2 |
| Transportation and communications | 65.6 | 81.3 | 100.0 | 104.5 | 107.7 | 112.1 | 113.6 | 114.8 | 119.0 |
| Trade | 56.3 | 73.1 | 100.0 | 103.3 | 108.4 | 112.5 | 115.1 | 118.8 | 123.1 |
| Other | 61.2 | 75.9 | 100.0 | 107.0 | 113.1 | 122.7 | 126.0 | 134.3 | 138.5 |
| Hungary: | | | | | | | | | |
| NMP | 53.1 | 73.9 | 100.0 | 103.0 | 111.2 | 116.0 | 118.2 | 117.2 | 120.2 |

## TABLE 15.—INDEXES OF NET MATERIAL PRODUCT BY SECTOR OF ORIGIN, EAST EUROPEAN COUNTRIES, 1965, 1970, AND 1975–81—Continued

[In constant prices, 1975 = 100]

| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|---|---|---|---|
| Industry | 48.5 | 69.0 | 100.0 | 105.4 | 112.6 | 118.5 | 124.0 | 121.5 | 127.3 |
| Agriculture and forestry | 88.3 | 89.6 | 100.0 | 92.8 | 107.5 | 105.2 | 99.9 | 104.8 | 105.0 |
| Construction | 47.0 | 73.4 | 100.0 | 105.1 | 111.8 | 117.1 | 120.1 | 114.0 | 117.2 |
| Transportation and communications | | | NA | NA | NA | NA | NA | NA | NA |
| Trade | | | NA | NA | NA | NA | NA | NA | NA |
| Other | | | NA | NA | NA | NA | NA | NA | NA |
| Poland: | | | | | | | | | |
| NMP | 46.9 | 62.7 | 100.0 | 106.8 | 112.2 | 115.5 | 112.9 | 106.1 | 103.8 |
| Industry | 41.3 | 60.0 | 100.0 | 109.3 | 117.7 | 120.6 | 118.6 | 113.7 | 95.5 |
| Agriculture and forestry | 96.2 | 93.6 | 100.0 | 101.6 | 100.8 | 108.7 | 100.8 | 95.8 | 97.7 |
| Construction | 36.5 | 53.5 | 100.0 | 106.8 | 106.8 | 107.6 | 99.3 | 78.0 | 54.3 |
| Transportation and communications | 40.6 | 55.1 | 100.0 | 107.0 | 111.5 | 118.1 | 113.7 | 122.1 | 112.2 |
| Trade | 43.7 | 58.9 | 100.0 | 107.9 | 113.4 | 113.6 | 116.9 | 117.1 | 109.7 |
| Other | 34.6 | 62.0 | 100.0 | 110.5 | 120.5 | 127.3 | 151.7 | 114.9 | 116.4 |
| Romania: [2] | | | | | | | | | |
| NMP | 40.5 | 58.7 | 100.0 | 111.3 | 121.1 | 130.0 | 138.1 | 142.1 | 144.9 |
| Industry | 29.5 | 53.7 | 100.0 | 108.0 | 119.8 | 131.0 | 141.3 | 149.9 | 155.8 |
| Agriculture and forestry | 79.4 | 77.0 | 100.0 | 127.8 | 123.0 | 127.8 | 130.2 | 111.1 | 108.7 |
| Construction | 39.5 | 69.6 | 100.0 | 111.1 | 132.0 | 134.0 | 136.0 | 136.4 | 132.0 |
| Transportation and communications | 38.2 | 59.2 | 100.0 | 105.0 | 110.7 | 116.4 | 121.0 | 130.9 | 135.5 |
| Trade | | | NA | NA | NA | NA | NA | NA | NA |
| Other | | | NA | NA | NA | NA | NA | NA | NA |

[1] Row 3 excludes forestry. Forestry is not included in the residual "other" sectors in the indexes as shown here, but is included in the total NMP.

[2] Romanian statistical sources no longer carry indexes of NMP originating in trade.

Note.—Price bases and coverages vary. See text.

## TABLE 16.—INDEXES OF NET MATERIAL PRODUCT PRODUCED PER CAPITA, 1965–81

[Indexes, 1975 = 100]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|
| 1965 | 48.0 | 56.7 | 59.2 | 55.1 | 50.7 | 45.2 |
| 1966 | 53.0 | 61.6 | 62.0 | 59.5 | 54.0 | 49.4 |
| 1967 | 59.3 | 64.5 | 65.4 | 64.0 | 56.6 | 52.6 |
| 1968 | 60.7 | 68.9 | 68.9 | 67.0 | 61.0 | 55.0 |
| 1969 | 66.2 | 73.6 | 72.1 | 72.0 | 62.3 | 58.5 |
| 1970 | 70.5 | 78.2 | 76.3 | 75.3 | 65.6 | 61.6 |
| 1971 | 75.0 | 82.2 | 79.5 | 79.5 | 70.4 | 68.9 |
| 1972 | 80.2 | 86.5 | 84.2 | 84.2 | 77.1 | 75.3 |
| 1973 | 86.4 | 90.4 | 89.0 | 89.8 | 84.7 | 82.6 |
| 1974 | 92.4 | 94.9 | 95.0 | 94.8 | 92.7 | 92.0 |
| 1975 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1976 | 106.0 | 103.4 | 104.1 | 102.4 | 105.8 | 110.3 |
| 1977 | 112.2 | 106.8 | 109.6 | 110.1 | 110.0 | 118.7 |
| 1978 | 118.3 | 110.5 | 113.7 | 114.4 | 112.2 | 126.3 |
| 1979 | 125.9 | 113.1 | 118.3 | 116.3 | 108.9 | 133.0 |
| 1980 | 132.6 | 115.9 | 123.6 | 115.3 | 101.4 | 136.0 |
| 1981 | 138.7 | 115.4 | 129.7 | 118.2 | 98.4 | 137.8 |

Note.—Calculated from official NMP indexes in table 15 and population indexes in table 1.

TABLE 17.—INDEXES OF NET MATERIAL PRODUCT DOMESTICALLY DISTRIBUTED, 1965–81, SELECTED YEARS

[At constant prices; indexes 1975 = 100]

| | Total NMP | | | | | NMP per capita | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1981 | 1965 | 1970 | 1975 | 1980 | 1981 |
| Bulgaria: | | | | | | | | | | |
| Consumption | 50.4 | 71.2 | 100 | 121.9 | 128.3 | 53.6 | 73.1 | 100 | 119.9 | 125.9 |
| Personal | 51.9 | 72.8 | 100 | 122.7 | 128.7 | 55.2 | 74.7 | 100 | 120.7 | 126.2 |
| Other | 26.9 | 47.2 | 100 | 134.0 | 121.9 | 28.6 | 48.5 | 100 | 131.9 | 119.6 |
| Net capital formation | 32.6 | 54.6 | 100 | 100.5 | 115.4 | 34.7 | 56.1 | 100 | 98.9 | 113.2 |
| Total NMP distributed | 44.5 | 66.2 | 100 | 115.0 | 123.9 | 47.3 | 68.0 | 100 | 113.2 | 121.5 |
| Czechoslovakia: | | | | | | | | | | |
| Consumption | 59.2 | 77.2 | 100 | 113.2 | 115.7 | 61.9 | 79.7 | 100 | 109.4 | 111.9 |
| Personal | 60.8 | 79.0 | 100 | 108.7 | 110.5 | 63.5 | 81.6 | 100 | 105.1 | 106.8 |
| Other | 54.7 | 72.0 | 100 | 126.2 | 130.6 | 57.2 | 74.4 | 100 | 122.0 | 126.2 |
| Net capital formation | 34.8 | 66.6 | 100 | 107.3 | 80.7 | 36.4 | 68.7 | 100 | 103.7 | 78.0 |
| Total NMP distributed | 53.2 | 74.3 | 100 | 111.7 | 106.6 | 55.6 | 76.8 | 100 | 107.9 | 103.0 |
| GDR: | | | | | | | | | | |
| Consumption | 61.4 | 77.2 | 100 | 121.2 | 124.3 | 60.8 | 76.3 | 100 | 122.0 | 125.2 |
| Personal | 64.0 | 78.8 | 100 | 121.4 | 124.6 | 63.3 | 77.9 | 100 | 122.2 | 125.4 |
| Other | 47.2 | 67.8 | 100 | 116.7 | 119.4 | 46.7 | 67.0 | 100 | 117.5 | 120.2 |
| Net capital formation | 53.6 | 86.8 | 100 | 116.3 | 112.0 | 53.1 | 85.8 | 100 | 117.1 | 112.8 |
| Total NMP distributed | 59.5 | 79.2 | 100 | 119.5 | 121.1 | 58.9 | 78.2 | 100 | 120.3 | 122.0 |
| Hungary: | | | | | | | | | | |
| Consumption | 58.8 | 79.3 | 100 | 116.5 | 120.0 | 60.9 | 80.8 | 100 | 114.6 | 118.0 |
| Personal | NA | NA | 100 | NA | NA | NA | NA | 100 | NA | NA |
| Other | NA | NA | 100 | NA | NA | NA | NA | 100 | NA | NA |
| Net capital formation | 39.2 | 67.9 | 100 | 90.4 | 82.6 | 40.7 | 69.2 | 100 | 88.9 | 81.2 |
| Total NMP distributed | 53.3 | 76.3 | 100 | 109.6 | 110.3 | 55.3 | 77.7 | 100 | 107.8 | 108.5 |
| Poland: | | | | | | | | | | |
| Consumption | 50.5 | 66.0 | 100 | 124.4 | 124.4 | 54.6 | 69.0 | 100 | 118.9 | 117.8 |
| Personal | 52.1 | 66.6 | 100 | 123.6 | 124.2 | 56.3 | 69.7 | 100 | 118.2 | 117.7 |
| Other | 41.8 | 62.8 | 100 | 129.3 | 125.9 | 45.1 | 65.7 | 100 | 123.6 | 119.3 |
| Net capital formation | 31.7 | 43.6 | 100 | 53.4 | 21.1 | 34.3 | 45.6 | 100 | 51.0 | 20.0 |
| Total NMP distributed | 43.7 | 57.8 | 100 | 99.1 | 86.9 | 47.2 | 60.4 | 100 | 94.7 | 82.3 |

Note.—These data are not entirely comparable among countries.

We shall note here also that NMP personal consumption is not uniformly defined among the East European countries. In some instances it refers to purchases of material goods and material services by the population from their personal incomes; in others it includes some state-financed consumption attributed to "consumption by the population" as distinct from "other consumption." The basic statistical sources make this distinction clear in their notes to tables. Military expenditures enter personal consumption (e.g., food for soldiers), "other" or collective consumption (current operational expenses), and accumulation (net capital formation), according to official commentaries on the NMP accounts.

## RATES OF GROWTH OF NATIONAL PRODUCT

The detailed indexes of growth of national product given above in Tables 11–17 and in supporting materials provide a ready basis for calculating rates of growth for various subperiods of the 1965–82 interval. We shall present in Tables 18–21 average annual rates based on the exponential equation, $I_n = I_o(1+R)^n$, least squares fitted to index observations, where the I refers to index values and R is the compound annual rate of growth. These rates obviously show only what is implicit in the basic indexes and the assumed growth equation, but they facilitate comparison of performance by subperiods. Year-to-year changes for the most recent two years will also be shown.

Table 18 shows per capita GNP growth rates of the six East European countries, and seven other European countries, Japan, and the United States. Facile comparisons drawn from such a table of course can be misleading; ideally one should compare performance among countries at about the same level of development and under conditions where the course of development is not disrupted by extraordinary exogenous factors. However, if we disregard these and other cautions and simply consider the performance of the countries in the same time spans, a general impression of comparative rates of growth may be gained. We observe that the countries of Eastern Europe are becoming more like the Western countries, although considerable disparities still exist among the countries in each group and between the two groups.

In the 1965–1970 period the overall impression is that the non-CMEA countries, with the exception of the United Kingdom and the United States, grew more rapidly than the countries of Eastern Europe. The unweighted average rate for Eastern Europe was 3.2 percent; for the group of other countries the corresponding rate was 5.1 percent. The 1970–75 unweighted average annual GNP growth for the group of countries outside Eastern Europe was 3.0 percent; the corresponding average for Eastern Europe was 4.0 percent. In the 1975–80 span, the unweighted East European average annual rate, 1.6 percent, was below the corresponding figure for the "Other Countries" group, 2.9 percent, but these unweighted averages are misleading; weighted in US dollars, the total for the six East European countries increased about 2 percent annually. It declined about 1 percent in 1981 and showed no change in 1982 (see Table 24). The performance in 1981 for the "Other Countries" taken as a whole was also unimpressive. Poland is outstanding for its poor growth record since 1975.

This is not the place to explain the recent poor performance, but evident major factors in Eastern Europe are growing labor scarcity, higher costs of energy and raw materials, increasing consumer expectations for a higher level of living that suggest trade-offs favoring consumption over investment, a growing burden of foreign indebtedness, and systemic factors that dampen initiative, innovation, and willingness on the part of the population to strive for higher quality and greater productivity.

At this point we may consider, but not actually compare, the NMP per capita annual average rates of growth (see Table 20) in relation to the per capita GNP rates noted above (Table 18). We may remind the reader, as we repeatedly have done in previous contexts, that differences between our GNP and the official NMP measures as to concepts, weights, methodology, and other considerations render direct comparisons inappropriate. Reference to Tables 18 and 20 shows NMP per capital rates of growth very substanially higher than those by GNP concept. The GNP measures, we believe, on methodological, conceptual, and bases of valuation grounds, provide a better basis for intercountry comparisons both in the CMEA area and in a broader context.

## TABLE 18.—AVERAGE ANNUAL RATES OF GROWTH OF GROSS NATIONAL PRODUCT PER CAPITA, 1965–82

[At constant prices; percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982[1] |
|---|---|---|---|---|---|
| East European countries: | | | | | |
| Bulgaria | 4.0 | 3.9 | 0.9 | 2.6 | 2.6 |
| Czechoslovakia | 3.2 | 2.7 | 1.4 | −1.1 | .1 |
| German Democratic Republic | 3.2 | 3.8 | 2.5 | 2.4 | .6 |
| Hungary | 2.7 | 3.0 | 1.9 | .3 | 1.8 |
| Poland | 3.0 | 5.7 | 0.0 | −6.3 | −4.8 |
| Romania | 3.2 | 5.2 | 3.0 | −.1 | 2.2 |
| Other countries: | | | | | |
| France | 5.0 | 2.8 | 3.0 | −.2 | ........ |
| Federal Republic of Germany | 4.0 | 1.3 | 3.7 | −.5 | ........ |
| Italy | 5.4 | 3.2 | 3.4 | −.4 | ........ |
| United Kingdom | 1.8 | 1.7 | 1.6 | −1.9 | ........ |
| Austria | 4.4 | 3.6 | 3.5 | .1 | ........ |
| Greece | 6.6 | 4.9 | 3.1 | −1.2 | ........ |
| Spain | 5.2 | 4.4 | 1.0 | −.3 | ........ |
| Japan | 10.6 | 3.9 | 4.2 | 2.1 | ........ |
| United States | 2.5 | 1.2 | 2.6 | .9 | 1.9 |

[1] Rough provisional estimates based on incomplete plan fulfillment and other data.

Sources: East European countries: Calculated by least squares fit in $I_n = I_o(1+R)^n$ to indexes in table 12. Other countries: United Nations, Yearbook of National Accounts Statistics, 1975, Table 4A; United States, Department of Commerce, Statistical Abstract, 1982–83, p. 868; Ibid., Survey of Current Business, No. 10, 1983.

## TABLE 19.—AVERAGE ANNUAL RATES OF GROWTH OF GNP BY SECTOR OF ORIGIN OF GNP, 1965–82

[Average annual rates at constant prices; percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 |
|---|---|---|---|---|---|
| Bulgaria: | | | | | |
| GNP | 4.7 | 4.4 | 1.2 | 2.9 | 2.9 |
| Industry (including crafts) | 8.7 | 5.5 | 3.4 | 2.6 | 3.0 |
| Agriculture and forestry | −.8 | 1.6 | −2.5 | 4.9 | 4.4 |
| Construction | 6.2 | 3.0 | 1.9 | −.1 | .1 |
| Transport and communications | 11.9 | 7.8 | 3.0 | 4.9 | 2.0 |
| Trade | 8.7 | 7.9 | 1.1 | 1.7 | 3.1 |
| Housing | 2.1 | 3.4 | 2.5 | 2.4 | 2.4 |
| Government and other sectors | 4.0 | 4.6 | −.1 | 1.4 | 1.7 |
| Czechoslovakia: | | | | | |
| GNP | 3.5 | 3.4 | 2.1 | −1.1 | .4 |
| Industry (including crafts) | 4.1 | 3.9 | 2.6 | 1.2 | .5 |
| Agriculture and forestry | 3.5 | 2.5 | 1.6 | −12.0 | 1.1 |
| Construction | 2.7 | 3.6 | 1.5 | −.2 | −1.5 |
| Transport and communications | 2.1 | 3.7 | 3.2 | 1.0 | −1.1 |
| Trade | 7.0 | 5.8 | 1.6 | .9 | .6 |
| Housing | .9 | 1.5 | 1.4 | 1.1 | 1.1 |
| Government and other sectors | 2.7 | 1.9 | 2.1 | 1.5 | 1.1 |
| German Democratic Republic: | | | | | |
| GNP | 3.2 | 3.5 | 2.4 | 2.4 | .6 |
| Industry (including crafts) | 4.1 | 3.3 | 2.9 | 3.7 | 2.2 |
| Agriculture and forestry | .4 | 3.7 | 1.6 | 2.5 | −5.9 |
| Construction | 7.7 | 4.6 | 2.7 | −1.8 | 2.9 |
| Transport and communications | 4.4 | 4.9 | 2.2 | −.8 | −2.6 |
| Trade | 4.5 | 5.3 | 2.1 | 1.3 | .6 |
| Housing | .8 | 1.2 | .8 | 1.0 | .9 |
| Government and other sectors | 2.1 | 2.7 | 2.7 | 2.8 | 2.9 |
| Hungary: | | | | | |
| GNP | 3.1 | 3.4 | 2.3 | .3 | 1.7 |
| Industry (including crafts) | 3.4 | 2.6 | 2.4 | .1 | .7 |
| Agriculture and forestry | .7 | 3.8 | 1.9 | −.8 | 4.9 |

## TABLE 19.—AVERAGE ANNUAL RATES OF GROWTH OF GNP BY SECTOR OF ORIGIN OF GNP, 1965–82—Continued

[Average annual rates at constant prices, percent]

| | 1965-70 | 1970-75 | 1975-80 | 1981 | 1982 |
|---|---|---|---|---|---|
| Construction | 8.0 | 3.2 | .9 | −2.8 | −1.3 |
| Transport and communications | 3.2 | 3.6 | 4.4 | 2.4 | −.3 |
| Trade | 8.3 | 6.3 | 2.8 | 2.3 | .9 |
| Housing | .9 | 2.0 | 1.9 | 1.6 | 1.5 |
| Government and other sectors | 3.7 | 3.5 | 2.0 | 1.2 | 1.6 |
| Poland: | | | | | |
| GNP | 3.8 | 6.6 | .9 | −5.4 | −4.0 |
| Industry (including crafts) | 6.3 | 7.6 | .7 | −12.7 | −4.0 |
| Agriculture and forestry | −1.1 | 1.5 | −.2 | 4.3 | −3.5 |
| Construction | 7.8 | 12.2 | −1.2 | −15.8 | −4.0 |
| Transport and communications | 6.3 | 12.5 | 3.8 | −13.9 | −9.6 |
| Trade | 5.8 | 9.7 | 1.4 | −6.4 | −14.8 |
| Housing | 3.2 | 2.6 | 2.7 | 2.2 | 1.9 |
| Government and other sectors | 2.7 | 4.1 | 2.0 | 2.7 | −.3 |
| Romania: | | | | | |
| GNP | 4.6 | 6.2 | 3.9 | .6 | 2.7 |
| Industry (including crafts) | 11.2 | 9.4 | 4.4 | −.2 | .9 |
| Agriculture and forestry | −1.8 | 3.8 | 2.9 | .3 | 7.8 |
| Construction | 7.7 | 2.7 | 4.7 | −4.7 | −1.6 |
| Transport and communications | 10.5 | 8.6 | 4.2 | .9 | 2.5 |
| Trade | 8.1 | 8.1 | 6.8 | 2.8 | .1 |
| Housing | 2.1 | 2.3 | 2.4 | 2.4 | 2.2 |
| Government and other sectors | 2.5 | 2.0 | 2.3 | 5.9 | 2.4 |

Sources: Calculated from indexes in table 13 by least squares fit of $I_n = I_o(1 + R)^n$ for the 5-year spans.

Table 19 shows overall and sector of production GNP growth rates by subperiods, 1965–1982. The 1982 figures are very provisional and will be revised when more adequate statistical data are published. The Table 18 overall GNP per capita rates will of course be lower than the overall GNP rates in Table 19 because of population growth, except for the GDR, where population declined.

We leave it to the reader to trace such sectoral changes as may be of interest; here we shall note only some general changes. Industry, with rare exceptions in particular time spans, grows faster than GNP as a whole. Agriculture, for reasons associated with weather and national priorities regarding provision of production inputs and income incentives to farmers, shows erratic growth rates, on the whole considerably below the overall GNP rates. Construction shows higher growth rates in most countries through 1975 than in later years. Housing has maintained relatively low but steady growth. Trade services in general maintain growth rates above the average for total GNP; the transport and communications sector shows a similar, though more erratic pattern of growth.

Tables 20 and 21 show NMP national income and sector of origin growth rates, per capita and overall NMP, respectively, for subperiods of 1965–1979. Given the population growth in the period, per capita rates will be lower than those for total NMP, except for the GDR, where population declined. Romania leads in overall NMP growth, followed by Bulgaria. We should note that Bulgarian and Romanian statistical reporting rank at the low end within Eastern

Europe, and accordingly we regard GNP and NMP statistics for these two countries as less reliable than for the others.

The Table 21 NMP sectoral growth rates are based on official constant price indexes, and cautions concerning the NMP measures we have made elsewhere should be kept in mind here as well. These cautions relate to such matters as sectoral boundary changes, changes in the constant price regimens for linked segments of the indexes, etc. We have noted that our GNP and the official NMP levels, indexes, and rates of growth are not comparable. The NMP growth rates are higher than those of GNP, but sectoral relationships of growth rates, by both concepts show general agreement as to rank. Thus, by Table 21, NMP in industry with rare exceptions grows faster than total NMP. Similarly, agriculture grows more slowly than total NMP. Construction shows high growth rates through 1975 but, with some significant exceptions, slows down in later years. In the more recent years government policy in an attempt to cope with the mounting foreign debt burden cut back sharply on investment, especially in construction.

TABLE 20.—AVERAGE ANNUAL RATES OF GROWTH OF NET MATERIAL PRODUCT PRODUCED PER CAPITA, 1965–81 [1]

[At constant prices; percent]

| | (1) Bulgaria | (2) CSSR | (3) GDR | (4) Hungary | (5) Poland | (6) Romania |
|---|---|---|---|---|---|---|
| 1965 to 1970 | 7.8 | 6.5 | 5.2 | 6.4 | 5.3 | 6.2 |
| 1970 to 1975 | 7.2 | 5.0 | 5.7 | 5.9 | 9.0 | 10.2 |
| 1975 to 1980 | 5.8 | 3.0 | 4.3 | 3.3 | .5 | 6.4 |
| 1981 | 4.6 | −.4 | 5.0 | 2.5 | −3.0 | 1.3 |

[1] By least squares fit of $I_n = I_o \ (1+R)^n$, calculated from table 16.

TABLE 21.—AVERAGE ANNUAL RATES OF GROWTH OF NET MATERIAL PRODUCT PRODUCED, BY SECTOR OF ORIGIN, 1965–81 [1]

[At constant prices; percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 |
|---|---|---|---|---|
| Bulgaria: | | | | |
| NMP, total | 8.5 | 7.8 | 6.1 | 5.0 |
| Industry (including handicrafts) | 13.0 | 9.5 | 7.4 | 6.0 |
| Agriculture and forestry | −2.6 | [2] 1.0 | [2] −4.0 | [2] 4.5 |
| Construction | 12.3 | 7.6 | 4.9 | 8.3 |
| Transport and communications | 9.9 | 11.4 | 5.4 | 9.9 |
| Trade | 11.3 | 15.5 | 15.1 | −1.9 |
| Other | 2.3 | [2] 1.5 | [2] 10.5 | [2] 0.1 |
| Czechoslovakia: | | | | |
| NMP, total | 6.8 | 5.7 | 3.7 | −0.4 |
| Industry (including handicrafts) | 6.0 | 5.9 | 3.4 | 1.1 |
| Agriculture and forestry | 6.9 | 1.5 | 0.7 | −17.4 |
| Construction | 6.5 | 7.7 | 1.6 | 0.5 |
| Transport and communications | 2.8 | 6.0 | 5.8 | 3.3 |
| Trade | 14.5 | 6.1 | 7.7 | 1.8 |
| Other | 17.4 | 4.3 | −2.5 | −4.6 |
| German Democratic Republic: | | | | |
| NMP, total | 5.2 | 5.4 | 4.2 | 5.0 |
| Industry (including handicrafts) | 5.8 | 5.8 | 4.9 | 5.6 |
| Agriculture and forestry | 1.0 | 3.2 | 1.1 | 2.8 |
| Construction | 8.1 | 4.5 | 2.5 | 5.2 |

## TABLE 21.—AVERAGE ANNUAL RATES OF GROWTH OF NET MATERIAL PRODUCT PRODUCED, BY SECTOR OF ORIGIN, 1965–81 [1]—Continued

[At constant prices; percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 |
|---|---|---|---|---|
| Transport and communications | 4.2 | 3.9 | 2.8 | 3.7 |
| Trade | 5.5 | 6.6 | 3.6 | 3.6 |
| Other | 5.4 | 6.2 | 6.0 | 3.1 |
| Hungary: | | | | |
| NMP, total | 6.8 | 6.3 | 3.6 | 2.5 |
| Industry (including handicrafts) | 7.0 | 8.0 | 4.4 | 4.8 |
| Agriculture and forestry | 1.2 | 2.1 | 1.3 | 0.2 |
| Construction | 9.5 | 6.0 | 3.2 | 2.8 |
| Transport and communications | 8.5 | NA | NA | NA |
| Trade | 8.8 | NA | NA | NA |
| Other | 15.8 | NA | NA | NA |
| Poland: | | | | |
| NMP, total | 6.0 | 10.0 | 1.4 | −2.1 |
| Industry (including handicrafts) | 8.0 | 10.9 | 2.6 | −16.0 |
| Agriculture and forestry | −1.1 | 1.6 | −0.5 | 2.0 |
| Construction | 8.3 | 14.4 | −4.1 | −30.4 |
| Transport and communications | 6.3 | 12.5 | 3.6 | −8.1 |
| Trade | 6.7 | 11.3 | 3.0 | −6.3 |
| Other | 12.0 | 11.1 | 5.0 | 1.4 |
| Romania: | | | | |
| NMP, total | 7.6 | 11.2 | 7.3 | 2.0 |
| Industry (including handicrafts) | 12.7 | 13.7 | 8.7 | 3.9 |
| Agriculture and forestry | −1.2 | [2] 3.6 | [2] 1.8 | [2] −2.1 |
| Construction | 12.0 | 7.2 | 6.4 | −3.2 |
| Transport and communications | 9.2 | 10.8 | 5.3 | 3.5 |
| Trade | 5.2 | [3] NA | [3] NA | [3] NA |
| Other | 4.9 | NA | NA | NA |

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[1] By least squares fit of $I_n = I_o (1+R)^n$. Calculated from table 15.

[2] Does not include forestry; however, forestry is included in NMP.

[3] Publication of an NMP series for the trade sector was discontinued in Romanian statistical sources after 1970. An evidently revised series for the trade sector of Romania appears in CMEA yearbooks, without, however, any methodological clarifications or any concomitant revision of the measures for the growth of NMP as a whole. The CMEA series, thus, does not seem to be consistent with the main body of Romanian NMP statistics.

## IV. Employment and Labor Productivity

Tables 22 and 23 relate employment indexes to our GNP indexes, setting forth average annual rates of growth of employment and labor productivity for sub-periods of the 1965–81 interval. Trends in labor productivity obviously reflect a number of contributing factors: trends in the amount of capital assets per employee, technological advance, organization and management of production, incentives to management and employees, changes in quality of the labor force, etc. We do not attempt here to go beyond the simple labor productivity index.

Average annual rates of growth of employment for the entire national economy in the 1965–81 period show generally declining trends. The GDR is an exception, showing consistently around one-half percent annual growth rate. Average annual rates for industry by subperiods in most of the countries declined, but not as sharply as those for total employment. Agricultural rates, 1965–80, were negative in all countries, but the declines became smaller in the 1975–80 period, and positive growth appeared in 1981 in the GDR, Hungary, and Poland. The curtailment of investment in view of the need to address consumer expectations and to adjust to adverse convertible currency balance of payments problems evidently reduced urban employment opportunities in the most recent period.

Employment in Eastern Europe evidently has small scope for growth from higher participation rates of the population in economic activity. Reference to our Table 7 shows these rates reaching around 50 percent in 1980. In Western Europe (except Spain) and the United States, the range was from about 40 to 47 percent, with substantial declines in some countries from around 1960. In the United States, the participation rate rose to 47 percent in 1980 from 39 percent in 1960. There have been references to labor shortages in almost all of the countries of Eastern Europe. In the more developed economies of the West, there have been some efforts to postpone retirement to later years than have been customary. There is substantial scope for augmenting the supply of labor by such postponement also in Eastern Europe.

Perhaps a more important source of "increasing" the supply of labor is through greater intensity of effort on the job. In the present difficult period of declining economic growth in Eastern Europe, there are heard increasingly admonitions to the population to maintain labor discipline, and labor codes are being redrafted to give force to the exhortations by party and government officials. Lax labor discipline seems to be a corollary of the sentiment that what belongs to everybody (the socialized enterprises' supplies and equipment) can be treated with less regard than possessions of a particular person or private enterprise, and of the feeling that with egalitarian income distribution goals, overall personal utility (or monetary plus psychic rewards) may be more readily achieved by less than average intensity of work. What seems to be required is reprivatization in essence, if not in official nomenclature.

Table 23 shows average annual rates of growth of labor productivity based on our overall GNP and sectoral GNP indexes and corresponding employment indexes. With employment (see Table 22) growing at relatively low rates and GNP at higher rates, the obvious arithmetic outcome is positive growth of output per unit of labor. To say that GNP grew because of the positive contribution of labor productivity, of course, subsumes the complex of the socio-political milieu, the contribution of capital and technology, and all else we do not know enough about.

At the total GNP level, the annual average growth rate of labor productivity in Eastern Europe increased from the 1965–70 period to the 1970–75 period. In the 1975–81 period, the rate declined sharply in all countries.

The reader may trace in Table 23 the changes in average annual labor productivity growth rates sector by sector for each country. On the whole, industry has shown substantial, though variable, rates by time periods. Agriculture's rates would seem to benefit from a reduction in its labor force while its fixed capital was increasing (see Tables 8 and 10). Taking into account Tables 8, 10, 13, 19, and 22 should help in making inferences regarding the rates shown in Table 23.

## TABLE 22.—AVERAGE ANNUAL GROWTH RATES OF EMPLOYMENT, 1965–81 [1]

| | 1965–70 | 1970–75 | 1975–80 | 1981 |
|---|---|---|---|---|
| Bulgaria: | | | | |
| Total | 1.0 | 0.8 | 0.3 | 1.1 |
| Industry (including handicrafts) | 4.0 | 2.6 | 1.3 | 2.5 |
| Agriculture and forestry | −3.7 | −3.8 | −2.6 | −1.8 |
| Construction | 4.3 | −.6 | .8 | 1.1 |
| Transport and communications | 2.9 | 2.2 | 1.9 | 1.0 |
| Trade | 4.7 | 5.6 | .5 | 2.3 |
| Other sectors | 5.1 | 4.7 | 1.6 | 1.7 |
| Czechoslovakia: | | | | |
| Total | 1.6 | 1.1 | 1.1 | 0.9 |
| Industry (including handicrafts) | 1.4 | 1.4 | .5 | .6 |
| Agriculture and forestry | −1.3 | −2.7 | −1.4 | 0 |
| Construction | 2.9 | 2.7 | 1.1 | −1.4 |
| Transport and communications | 2.8 | .4 | .8 | 1.0 |
| Trade | 3.5 | 3.7 | 1.8 | .7 |
| Other sectors | 3.5 | 2.1 | 2.4 | 2.0 |
| German Democratic Republic: | | | | |
| Total | 0.4 | 0.4 | 0.8 | 0.5 |
| Industry (including handicrafts) | .8 | .4 | .6 | .5 |
| Agriculture and forestry | −5.2 | −2.2 | −.2 | .3 |
| Construction | 7.1 | −.9 | −.2 | 6.7 |
| Transport and communications | .5 | 1.6 | .5 | 0 |
| Trade | −.7 | −.1 | .1 | −.2 |
| Other sectors | 2.0 | 2.3 | 2.2 | −0.9 |
| Hungary: | | | | |
| Total | 1.5 | .04 | −0.1 | −0.7 |
| Industry (including handicrafts) | 2.5 | .4 | −1.4 | −2.3 |
| Agriculture and forestry | −1.1 | −3.0 | −1.1 | .7 |
| Construction | 4.0 | 2.1 | −1.8 | −2.5 |
| Transport and communications | 2.6 | 1.5 | .4 | −1.5 |
| Trade | 4.0 | 2.4 | 1.0 | .4 |
| Other sectors | .9 | 2.7 | 3.1 | 1.0 |
| Poland: | | | | |
| Total | 2.5 | 2.5 | 0.4 | 0.3 |
| Industry (including handicrafts) | 3.8 | 3.0 | .4 | −.2 |
| Agriculture and forestry | −.3 | −.1 | −.5 | .3 |
| Construction | 4.3 | 6.6 | −.8 | −3.2 |
| Transport and communications | 3.4 | 2.7 | 1.1 | −1.0 |
| Trade | 4.3 | 4.6 | 1.5 | 3.9 |
| Other sectors | 5.2 | 3.8 | 2.1 | 1.8 |
| Romania: | | | | |
| Total | 0.5 | 0.5 | 0.4 | 0.3 |
| Industry (including handicrafts) | 3.9 | 6.6 | 3.5 | 2.3 |
| Agriculture and forestry | −2.1 | −4.5 | −3.9 | −2.6 |
| Construction | 4.1 | 1.7 | 2.3 | −7.7 |
| Transport and communications | 3.0 | 3.4 | 4.9 | 14.0 |
| Trade | 2.2 | 5.4 | 2.5 | −.3 |
| Other sectors | 3.6 | 2.5 | .5 | .6 |

[1] 1965–80 by least squares fit of $I_m = I_o(1 + R)^m$; 1981 figures reflect change over 1980.

Note.—Figures here reflect GNP concept sectoral definition.

## TABLE 23.—AVERAGE ANNUAL RATES OF GROWTH OF LABOR PRODUCTIVITY, 1965–81 [1]

[At constant prices, percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 |
|---|---|---|---|---|
| Bulgaria: | | | | |
| GNP | 3.7 | 3.7 | 0.9 | 1.8 |
| Industry (including handicrafts) | 4.5 | 2.8 | 2.0 | .0 |
| Agriculture and forestry | 3.0 | 5.6 | .1 | 6.8 |
| Construction | 1.8 | 3.7 | 1.1 | −1.3 |

## TABLE 23.—AVERAGE ANNUAL RATES OF GROWTH OF LABOR PRODUCTIVITY, 1965–81 [1]—Continued

[At constant prices, percent]

| | 1965–70 | 1970–75 | 1975–80 | 1981 |
|---|---|---|---|---|
| Transport and communications | 8.7 | 5.4 | 1.0 | 3.8 |
| Trade | 3.8 | 2.2 | .6 | –.6 |
| Czechoslovakia: | | | | |
| GNP | 1.8 | 2.3 | 1.0 | –1.9 |
| Industry (including handicrafts) | 2.7 | 2.4 | 2.1 | .6 |
| Agriculture and forestry | 4.9 | 5.4 | 3.0 | –12.0 |
| Construction | –.2 | 1.0 | .4 | 1.2 |
| Transport and communications | –.7 | 3.3 | 2.4 | .0 |
| Trade | 3.4 | 2.0 | –.2 | .3 |
| German Democratic Republic: | | | | |
| GNP | 2.9 | 3.1 | 1.6 | 1.8 |
| Industry (including handicrafts) | 3.2 | 2.8 | 2.3 | 3.1 |
| Agriculture and forestry | 6.0 | 6.0 | 1.8 | 2.2 |
| Construction | .6 | 5.6 | 3.0 | –8.0 |
| Transport and communications | 3.9 | 3.2 | 1.7 | –.8 |
| Trade | 5.2 | 5.4 | 1.9 | 1.6 |
| Hungary: | | | | |
| GNP | 1.5 | 3.0 | 2.4 | 1.0 |
| Industry (including handicrafts) | .9 | 2.3 | 3.9 | 2.4 |
| Agriculture and forestry | 1.9 | 7.0 | 3.0 | –1.4 |
| Construction | 3.8 | 1.0 | 2.8 | –.3 |
| Transport and communications | .6 | 2.1 | 4.0 | 4.0 |
| Trade | 4.1 | 3.9 | 1.7 | 1.9 |
| Poland: | | | | |
| GNP | 1.3 | 4.0 | 0.5 | –5.7 |
| Industry (including handicrafts) | 2.4 | 4.5 | .3 | –12.6 |
| Agriculture and forestry | –.8 | 1.6 | .2 | 4.0 |
| Construction | 3.4 | 5.3 | –.4 | –13.0 |
| Transport and communications | 2.8 | 9.6 | 2.6 | –13.0 |
| Trade | 1.4 | 4.9 | –.1 | –9.9 |
| Romania: | | | | |
| GNP | 4.1 | 5.7 | 3.5 | 0.3 |
| Industry (including handicrafts) | 7.0 | 2.6 | .9 | –2.4 |
| Agriculture and forestry | .4 | 8.6 | 7.0 | 3.0 |
| Construction | 3.4 | 1.0 | 2.4 | 3.2 |
| Transport and communications | 7.2 | 5.1 | –.6 | 11.5 |
| Trade | 5.8 | 2.6 | 4.2 | 3.2 |

[1] By least squares fit of $L_n = L_o(1+R)^n$ for 1965–80. 1981 figures reflect change over 1980. Calculated from annual average employment and the GNP indexes in table 13.

Note.—Figures reflect GNP concept definition.

## V. International Comparisons of the Magnitude and Rate of Growth of GNP

To combine the GNPs of the six East European countries into a single regional aggregate for determing combined growth rates and to make size comparisons among them and with other countries, we have for many years used GNP estimates in US dollars. Our early estimates have been provided in previous volumes of the JEC Compendiums and have been updated in our Occasional Papers. More recently we have also used the results derived for 1975 by the Statistical Office of the United Nations and The World Bank, International Comparisons Project (ICP), for Hungary, Poland, and Romania.[6] These estimates are shown in 1981 US dollars in Table 24, and the methodology is given in footnotes to the table. We may note that so far as a growth rate for 1965–82 is concerned, the result for the combined six countries is practically the same whether we use our earlier dollar series or the ICP related series shown in Table 24.

The 1982 East European total GNP in 1981 US dollars, 643.1 billion in Table 24, Part A, is around one-fourth of the US GNP of 1982 in 1981 dollars. Part B of Table 24 provides per capita GNP values in 1981 US dollars and the ratios of the East European countries' values to the comparable US value for 1982. For the six countries as a whole, per capita GNP in 1982 was close to one-half of that of the US. The GDR ranked highest (at close to 66 percent) and Romania the lowest (about 35 percent). One may see in the table the deterioration of Poland's standing beginning around 1976, when its per capita GNP was about 49 percent of that of the US; by 1982, it had fallen to 41 percent.

The values presented in Table 24 are purchasing-power based, directly from the ICP for 1975 for Hungary, Romania, and Poland, and for the other three countries by the linkage noted in the table. For all other years, our real GNP indexes are applied to the 1975 values. Obviously, different outcomes would follow from the use of other values as the starting point and other real indexes to show the dollar values over an extended period. The interaction of a base-year value and the index applied to it is crucial. This can be illustrated for the case of Hungary.

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[6] Irving B. Kravis, Alan Heston, and Robert Summers, "World Product and Income," (UN International Comparisons Project, phase III), the Johns Hopkins University Press, Baltimore, 1982.

## TABLE 24.—EASTERN EUROPE: GNP AND GNP PER CAPITA AT CONSTANT 1981 DOLLARS

[A. GNP in millions of 1981 dollars]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Total, Eastern Europe | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Million dollars | Index: 1975-100 |
| 1965 | 27,117 | 68,662 | 86,648 | 42,588 | 113,903 | 44,669 | 383,587 | 65.5 |
| 1970 | 34,758 | 81,321 | 101,149 | 49,453 | 138,582 | 56,858 | 462,122 | 78.9 |
| 1975 | 43,666 | 95,897 | 119,845 | 58,180 | 189,839 | 78,642 | 586,069 | 100.0 |
| 1976 | 44,976 | 97,623 | 122,242 | 58,355 | 194,585 | 87,135 | 604,916 | 103.2 |
| 1977 | 44,539 | 101,843 | 125,957 | 62,020 | 198,192 | 89,337 | 621,888 | 106.1 |
| 1978 | 45,500 | 103,473 | 128,114 | 63,533 | 205,216 | 93,505 | 639,341 | 109.1 |
| 1979 | 47,247 | 104,336 | 131,710 | 63,707 | 201,609 | 96,887 | 645,495 | 110.1 |
| 1980 | 45,893 | 106,733 | 134,466 | 64,347 | 196,673 | 95,393 | 643,505 | 109.0 |
| 1981 | 47,159 | 106,158 | 137,223 | 64,813 | 186,042 | 95,707 | 637,102 | 108.7 |
| 1982 | 48,557 | 108,172 | 136,623 | 67,198 | 184,334 | 98,224 | 643,107 | 109.7 |

[B. GNP per capita in 1981 dollars]

| Year | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Eastern Europe | United States |
|---|---|---|---|---|---|---|---|---|
| 1965 | 3,306 | 4,849 | 5,091 | 4,195 | 3,616 | 2,348 | 3,834 | 8,760 |
| 1970 | 4,094 | 5,673 | 5,930 | 4,784 | 4,261 | 2,807 | 4,487 | 9,798 |
| 1975 | 5,007 | 6,479 | 7,112 | 5,524 | 5,580 | 3,702 | 5,520 | 11,124 |
| 1976 | 5,135 | 6,544 | 7,282 | 5,511 | 5,663 | 4,063 | 5,661 | 11,618 |
| 1977 | 5,059 | 6,776 | 7,513 | 5,830 | 5,712 | 4,125 | 5,780 | 12,127 |
| 1978 | 5,162 | 6,836 | 7,646 | 5,952 | 5,862 | 4,278 | 5,906 | 12,609 |
| 1979 | 5,353 | 6,848 | 7,866 | 5,955 | 5,718 | 4,394 | 5,932 | 12,825 |
| 1980 | 5,179 | 6,971 | 8,034 | 6,008 | 5,528 | 4,297 | 5,882 | 12,640 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1981 | 5,304 | 6,932 | 8,199 | 6,050 | 5,182 | 4,282 | 5,797 | 12,848 |
| 1982 | 5,445 | 7,038 | 8,183 | 6,277 | 5,088 | 4,370 | 5,826 | 12,455 |
| 1982 as percent of United States | 43.7 | 56.5 | 65.7 | 50.4 | 40.9 | 35.1 | 46.8 | 100.0 |

Sources: Part A: For Bulgaria, Czechoslovakia and the German Democratic Republic, 1975 per capita values were provisionally estimated beginning with United Nations estimates. (UN, Economic Bulletin for Europe, Vol. 31, No. 2, p. 30) based on physical indicators and regressions on dollar GDPs, yielding per capita dollar values for the six East European countries in 1970. These were converted to 1970 total GDP, multiplying by midyear populations. Taken as total GNP approximations, these were advanced to 1975 using the project's growth indexes (Tables 1-6 of this paper). Next, they were expressed, respectively, in ratios to Hungary, Poland, and Romania. For each of the latter, Kravis, et al. (World Product and Income, Baltimore, 1982, p. 10) provide estimates of total GDP in 1975 "international" dollars (ICP, International Comparisons Project). Corresponding 1975 "ICP" dollar estimates for Bulgaria, Czechoslovakia, and the GDR were calculated as the geometric means of three derived dollar values based on the ICP values for Hungary, Poland, and Romania and on the 1975 UN based ratios to these countries. We are indebted to Daniel R. Kazmer for the methodology followed here. Our growth indexes and the US GNP implicit price deflators (Statistical Abstract of the United States, 1984, p. 486, and Survey of Current Business, No. 12, 1984, p. 19 and No. 2, 1985, p. 7) were used to calculate the annual values in 1981 dollars. Because of revisions since the original writing, growth shown here may differ slightly from that in other tables. Part B. Calculated from total values in Part A and midyear of annual average population data as currently given in statistical publications of individual countries.

The Hungarian official statistical yearbook, Statisztikai evkonyv, 1982, p. 60, in a footnote, gave the 1982 Hungarian per capita GDP at 2,149 US dollars, a value calculated by the Hungarian National Bank using the official rate of exchange. It may be noted that this figure is not much different from the value provided by Hungary in its application for membership in the IMF and The World Bank. If this value is carried back to 1950 by the official Hungarian NMP per capita index (as a surrogate for a GNP index) and converted to 1950 US dollars using the US GNP deflator, the result is about 130 dollars. If personal consumption were assumed at 60 percent of GNP, the corresponding resulting per capita consumption in 1950 would be about 80 dollars. For comparison, the 1982 Hungarian per capita GNP level would be about 16 percent of the US level, and in 1950, about 7 percent. (These calculations are based on official Hungarian statistics and official US statistics, Statistical Abstract of the United States, selected years, and Survey of Current Business, No. 10, 1983.) Such low values are extremely puzzling. Of what use are they for international comparisons? What do they suggest when compared to the direct 1975 ICP ratio of close to 50 percent?

A similar calculation carried out for Romania with an NMP per capita index of 1950=100, 1975=784, and 1981=1100 (see Anuarul Statistic 1982, p. 49) would raise even more striking questions.

These outcomes for Hungary and Romania obviously follow from the starting point of GNP per capita and the assumed rate of growth of GNP, and perhaps should not be faulted as arithmetic exercises. The issue, of course, is international comparability, and here, for purposes of scholarly reference, whether for pre-college children, college students, or other seekers after something approaching "real" comparisons, one would recommend an approach along the lines followed by the ICP. But the results obtained by the ICP have been criticized by representatives of the Hungarian and Polish statistical offices (at a World Bank workshop on national incomes of centrally planned economies, June 7-8, 1982). The ICP results were regarded by these representatives as much too high and not sufficiently supported by expertise and time, even though the ICP worked in collaboration with the national statistical offices.

On the face of it, the ICP results as regards Hungary do not seem far from reality. The Hungarians, from observers' reports, are well fed, relatively well housed, and not much lacking in other consumer products. For 1982, a 50 percent level vis-a-vis the US per capita GNP surely does not seem unreasonable; a 16 percent level seems completely unacceptable. "Exchange rate" based comparative GNP (or GDP) levels are fickle and surely not as instructive as purchasing power parity based comparisons.

Most of the countries of Eastern Europe have not been providing GNP (or GDP) statistics, but Hungary has recently published GDP national statistics in their yearbooks and Poland has published input-output tables in SNA (UN standard national accounts) concept. It is rare for countries to match the SNA concepts in ultimate detail of classification, and some deviations from pure SNA, as for example elaborated in a recent Hungary-France comparison, are of relatively insignificant importance as regards international comparability. Far more crucial as regards international comparability of structure and real rates of growth are matters of valuation.

For reasons of social policy and other considerations, market prices in East European countries have been, and still are, displaced from what factor costs and scarcities would indicate. The state budgets and official price policies continue to be instruments of redistribution of income. We cannot explore here the evolution of economic systems in Eastern Europe, but we may note that continuing efforts at economic reforms have not brought about the desired gains in incentive-based efficiency and a price system adequately reflecting costs of factor inputs. Even in Hungary, the 1968 New Economic Mechanism soon became dormant, but in the more recent years has been revived. Its outcome remains in doubt, however, because of the compromises being made to meet consumer expectations and foreign trade problems. The state budget in 1981 spent close to 13 percent of its total of 482.1 billion forints in consumer goods subsidies, 17 percent on support of economic units, and 21 percent on "other" outlays, not specified in detail. These amounts can be related to the official GDP of 779.9 billion forints and NMP of 634.9 billion forints (see "Magyar statisztikai zsebkonyv, 1982," pp. 95–97). Thus subsidies for consumer goods represent about 8 percent of GDP. The Polish subsidy situation is very similar (see Rocznik statystyczny 1982, pp. 71, 81). Polish economic reform is sidetracked for expediency, and economic rationality is not aided by a price system in very poor accord with factor costs.

Deviation of market prices from factor costs because of state intervention is of course present in Western countries, but the departures are not so great that calculations of real GNP growth and structure would be seriously impaired. For intertemporal and intercountry comparisons with Western economies, we believe our real GNP indexes and structures derived in a uniform methodology are on much sounder bases than official East European NMP or GDP market price measures. Our independently constructed adjusted factor cost measures rely on basic official East European statistics for labor remuneration, capital data, physical output series, and employment.

Statistical offices in Eastern Europe are aware of the distortions from factor cost introduced by valuations in actual sales prices. For example, an article by Stanislaw Kuzinski, the chief of the Polish Central Statistical Office until his departure in the fall of 1980 (see "Polityka," Jan. 17, 1981) criticizes the official indexes based on sales prices as a species of falsification that affects the appraisal of development of enterprises, branches, and overall production, and he characterizes the planning system as "particularly favorable soil for growth of distorted or outright falsified statistics" because of its "multitude of assortment directives, value, terminological, and normative relations, as well as limits, comments and interdictions. . . ." He points to political manipulation of statistics by means of selection, concealment, and comment. One might surmise that the Polish statistics are by far not the worst in the lot. Surely, independent calculations in a uniform methodology and relying on the more basic official statistics are required for perspective on real changes in the East European economies.

We may note that the Polish Central Statistical Office has indeed calculated measures of economic growth and composition of economic activity in synthetic prises that approximate factor costs. The results of these calculations are in general accord with our independent findings (see my article in the JEC Compendium, August 23, 1977, pp. 210-212 for more details). Factor cost estimates by Polish economists, writing in Wiadomosci statystyczne (Statistical News, a journal of the Polish Central Statistical Office), November 1976 and March 1979, provide insights into the realities of costs as regards structure and growth of the economy. Without such knowledge, the authors state, the planners do not know where the economy has been, how fast it has grown to its present size, what is its structure, and what constraints better knowledge of cost realities would impose for future plans. L. Zienkowski, director of the National Accounts Division in the Central Statistical Office, in "Prices—the Achilles Heel of Statistics", Wiadomosci statystyczne, January 1982, affirms the continuing need for regular estimates in prices approximating factor costs, such as those by Antolak and Bocian. Calculations both in current prices and in adjusted prices are useful. The rates of growth officially calculated in adjusted prices, 1970-80, broadly agree with our independent findings. We may add that for the more recent years the Hungarian consumer price indexes and some other measures have moved into substantial agreement with our calculations.

As regards comparison of GNPs in US dollars, there are other approaches than those based on purchasing power parity ratios for conversion of domestic final uses in national currencies into dollars. Quantities and prices are the essence of economics; one may question the use of relations of physical indicators of global output (PIG method) onto ICP results, and applying international analogy by countries assumed to be at comparable levels to obtain dollar estimates directly for countries that do not have ICP results. Such relativity results can be calculated, but are they acceptable substitutes for direct economic calculation in international comparisons? Assumption piled on top of assumption would suggest caution, to say the least. If the intent of international comparisons is to be realistic, then conversions by exchange rates (realistic, or for Eastern Europe probably of dubious quality) are not suitable for the entire spectrum of economic activity. Rather than force available ICP results for Hungary, Poland, and Romania into exchange rate configurations by analogues of deviations between ICP results and exchange rate values, where both are available for selected countries, it would appear preferable to upgrade the ICP direct results for general orientation, and put the acceptable exchange rate values into a subordinate position of definitely more limited value.

## VI. Concluding Remarks

What does the future hold for the East European economies? Reference to the tables in this paper will show a general slackening in the overall rates of growth by five-year subperiods, 1965-1980, and in 1981-1982. The reasons for this slowdown are complex, and the individual country papers and the papers addressed to specific aspects of the internal and external economic and political environment will explore the problems and suggest future developments. We shall limit our remarks here to a few general observations.

The rapid gains in the early post World War II years were made possible by the initial low levels of production and the stern governmental policies of mobilization of labor and capital for rapid development under highly centralized planning. Investment had high priorities, and reserves of labor were available from the underemployed persons in agriculture. Such war-like pressure could not be sustained for long; by the mid-1950s, "new course" policies followed upon the death of Stalin and popular unrest and revolt in Eastern Europe (most notably in Hungary and Poland). A succession of on-and-off-again "reforms" has been evident since then because the reforms came to be regarded as necessary for efficiency but also as challenging to the political monopoly of the national Communist parties and their governments, or because the reforms failed to cope quickly with economic problems. But the will of the population to work diligently could not be sustained for long by the political leaders' exhortations for higher discipline and productivity; increased personal consumption became a more significant item on the planning agenda.

With rapid growth of output from fuller utilization of labor and from high rates of investment and easy transfers of technology from advance already achieved in the West, substantial growth of output could support both high rates of investment and increased levels of personal and collective consumption. During the 1970s, as labor became scarcer and consumer expectations had arisen, growth of output in some countries was sustained by loans from abroad. Then by the latter half of the 1970s, the rate of growth of output slowed while consumer expectations remained high and the cost of energy increased. The trade-off was in lower rates of investment. Service of the external debt in convertible currencies became a harsh burden and could be met by further loans to pay interest, by reducing imports more than exports, and by programs of austerity affecting both consumption and investment. Growth of labor productivity declined sharply from the mid-1970s to the early 1980s.

Future economic growth in Eastern Europe will depend on many factors, external and internal. But whatever the external environment should afford, the dominant internal factor is increasingly recognized as the will of the population to work more productively. The "new economic mechanisms," or reforms, recognize the need for personal motivation through economic incentives. These reforms address decentralization of decision making, increased scope for enterprise initiatives, and personal incentives for greater productivity. It will take time to judge how well the projected reforms will work.

Past experience suggest skepticism as to the outcome. At issue there is more than an array of economic levers to spur particular activities. The essence of effective reform is a substantial reprivatization of economic activity. Labels, "socialist" or "private" are of no real consequence; what matters is de-bureaucratization of economic management, and, on the production and final use levels, direct and sustained personal interest in and reward for extra endeavor. In effect this means a species of control akin to that exercised through private ownership. In practice, where the "reforms" are backstopped by extensive government regulation and intervention, the prognosis is poor. A given intervention tends to generate further intervention to buttress the intitial one. After some time, the need to re-reform will become evident, leading to a treadmill of reform.

The subject for study is indeed political economy: how to mesh personal aims within the bounds of collective safeguards and redistributive goals. This problem is not one that confronts only the centrally planned economies, although it is most urgent there. The less developed countries of the world and the developed countries of the West can benefit from the experience of the countries of Eastern Europe. What should the national policy be as to trade-offs between egalitarian-oriented redistribution and higher rewards for extra effort, between higher current consumption and lower future growth, between bureaucratic direction of the economy and broad scope for initiative and responsibility at the level of local governments, enterprises, and individuals, between isolation of the domestic economy from external competition and specialization based on comparative advantage? Good answers will require objective education, informed debate through many independent channels of communication, and opportunity for individuals to choose freely among alternatives.

# ALTERNATIVE ESTIMATES OF THE DOLLAR GNP AND GROWTH RATES OF THE CMEA COUNTRIES

By Paul Marer*

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## I. INTRODUCTION, SUMMARY, AND INTERPRETATION

Centrally planned economies (CPEs) account for about a third of the world's population and fifth of its output. In view of their importance in the world economy, they need to be included in international comparative studies. This presents problems because most CPEs report net material product (NMP) not gross national product (GNP), because their prices and exchange rates are set administratively so conversion to dollars is problematic, and because they follow methods of growth rate computations that are shown in some cases to be strongly upward biased.

In 1981 the author was invited by the World Bank to submit a research proposal to identify and evaluate alternative methods for computing the per capita dollar GNPs and growth rates of CPEs and to undertake illustrative benchmark-year computations for

1980. Eight countries were included in the project: Bulgaria, Czechoslovakia, the German Democratic Republic (GDR), Hungary, Poland, Romania, the USSR, and Cuba. China was not included because after it became a member in 1980, the study of its economy and data was undertaken by Bank personnel.

The project commenced in 1982 and was completed in 1983. Much of the country-specific research was carried out by a team of independent experts, assembled by the author and retained as consultants by the World Bank.[1]

Two workshops held of the Bank discussed methodological issues and preliminary findings, but it was the author's responsibility to select and apply a uniform method to convert GNPs in national currency units to dollars. The findings and conclusions of the project reflect the views of the independent experts and should not be taken as the official positions of the Bank or of the countries involved.[2]

This study summarizes the project and elaborates on some of the policy implications of its results. A more detailed discussion and documentation of the project is being published as a book.[3] The main findings and conclusions are:

1. CPEs compute NMP not GNP. After reviewing the main alternative approaches to estimating GNP for 1980 in local currency, it was concluded that scaling up from official NMP to GNP is the best practical method for six countries. In brief, this method adds to official (in some cases adjusted) NMP, depreciation and net value-added in non-material services. For Bulgaria, lack of data necessitated another method, estimating GNP as the sum of the end uses of all goods and services produced. Neither of these methods could be applied to Cuba, for which no comprehensive, reliable and up to date statistical information could be obtained or reconstructed on NMP or GNP.

2. Finding appropriate "convertors" for any country to translate GNP in local currency to dollar values is problematic and cannot be solved fully satisfactorily for numerous methodological and practical reasons. Even for market-type economies (MTEs), there is often no single convertor best suited to serve both as an equilibrium exchange rate and for measuring a country's level of development in terms of dollar per capita GNP.

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[1] Prof. Abram Bergson (Harvard Univ.), general consultant on methodology; Prof. Robert W. Campbell (Indiana Univ.), country expert on the USSR; Prof. Irwin Collier (Univ. of Houston), country expert on the GDR; Prof. Zbigniew Fallenbuchl (Univ. of Windsor, Canada), country expert on Poland; Dr. Edward Hewett (Brookings Institution), country expert on Hungary; Prof. Marvin Jackson (Arizona State Univ.), country expert on Romania; Drs. Friedrich Levcik and Peter Havlik (Vienna Institute for Comparative Economic Studies, Austria), country experts on Czechoslovakia; Prof. Carmelo Mesa-Lago ( Univ. of Pittsburgh) and Dr. Jorge Perez-Lopez (consultant), country experts on Cuba; Messrs. Shamsher Singh and Jong-goo Park (World Bank), country experts on Bulgaria (the county expert from Austria initially recruited for the Bulgarian country study resigned because of ill health after the project was under way; since no other independent experts could be found to do a study on very short notice, two staff members of the Bank completed the study); Prof. Thomas Wolf (Ohio State Univ.) general consultant on exchange rates and purchasing power parity computations.

[2] The World Bank formally asked for the cooperation of the countries included in the project; Bulgaria, Hungary, Poland, and Romania responded and cooperated in various degrees. The project also obtained valuable inputs from other experts, several residing in the countries being studied, but they may not wish to be associated with this project's findings and conclusions.

[3] Paul Marer, *Dollar GNPs and Growth Rates of the USSR and Eastern Europe* (Baltimore and London: The Johns Hopkins University Press for the World Bank, 1985).

3. It is the view of many experts on international comparisons that the most appropriate dollar convertors for ranking per capita incomes—and by implication the development levels—of countries are those based on purchasing power parity (PPP) calculations. PPPs are computed as ratios of what a representative sample of goods and services in a country's GNP basket costs in local currency and in U.S. dollars (or some other currency or numeraire).

4. The World Bank, however, in almost all cases relies on its member countries' prevailing and (for most countries) largely market-determined exchange rates as convertors because exchange rates are available for almost all MTEs on a timely basis. PPPs take a long time to compute, require a great deal of data from the countries and thus can be obtained only with delay and only for about half of the world's nations. However, the disadvantages of relying on exchange rate convertors are recognized. Their value fluctutates widely, so that a country's per capita GNP in dollars can easily change by as much as one-third from year to year as the exchange rate moves up or down in response to market forces or government intervention.

5. Exchange rates of MTEs, even after their fluctuations are smoothed, deviate systematically from PPP values. That is, the ratio of PPPs to prevailing exchange rates (called the exchange rate deviation index, or ERDI) tends to rise as one moves from higher to lower levels of per capita income. For a very poor country it can make a difference of several hundred percent whether its exchange rate or PPP is used as the convertor, the latter typically yielding a much higher dollar value. Many factors determine a country's ERDI; the most important is that the poorer a country, the lower tend to be its relative prices of non-tradeables.

6. One of the main tasks of our project was to find the best set of convertors for CPEs comparable to the prevailing exchange rates of MTEs because the Bank relies on exchange rates to convert the GNPs of MTEs also.

7. We found that CPEs employ, largely for accounting purposes, a plethora of exchange rates and exchange-rate-type coefficients. Since in CPEs prices play only a limited role and their fully controlled exchange rates cannot undergo the test of being market determined, their governments have no need to maintain exchange rates at realistic levels, and most CPEs usually don't. To be sure, there are significant differences between CPEs in the role that exchange rates play in their economy, how they are determined, and how many exchange rates are used. For example, a comparative analysis of the price and exchange rate systems currently in place in the eight countries revealed that there is apparently no diret link between foreign and domestic prices in the USSR, the GDR and Cuba, some linkage in Bulgaria, Czechoslovakia, Poland and (since 1981) Romania, and substantial linkage since 1980 in Hungary. The major difference between Hungary and MTEs is that in the former there appears to be only a weak link between the foreign and domestic prices of goods other than those actually traded, but in this respect Hungary may not be that different from many less developed countries. Notwithstanding the differences between the CPEs, we rejected using any of these countries' exchange rates as

convertors, preferring a method that could be applied uniformly to all or to a large subgroup of CPEs.

8. Our preferred approach was to start with the best PPP numbers computed in the West and adjust them by ERDIs, based on the relationship found between PPPs and exchange rates for MTEs at comparable levels of (PPP-based) per capita incomes levels. This approach yielded "adjusted PPPs" that can be taken as reasonable exchange rate proxies. The resulting 1980 per capita dollar GNPs are:

| | | | |
|---|---|---|---|
| GDR | $5,910 | USSR | $4,190 |
| Czechoslovakia | 4,740 | Poland | 3,730 |
| Hungary | 4,390 | Romania | 2,680 |

Given the many statistical difficulties for computing PPPs and the uncertainties in determining ERDIs for CPEs, the numbers are simply the "best" (midpoint) values within a comparatively wide range of possible estimates.

9. There is no failsafe method to test the accuracy of our—or of any of numerous other types of—convertors and thus establish unequivocally the "correct" dollar per capita GNP figures. The only test is an unbiased assessment of the plausibility of the resulting per capita dollar GNP values. Our estimates were found to be more plausible according to each of several independent criteria than those that result from any other set of convertors. The main plausibility criteria were: (i) comparisons of the intra-CMEA ranking of the CMEA countries' per capita dollar GNP against the ranking that result from computations of relative income levels carried out by experts in the CMEA; (ii) findings of independent multilateral studies, involving CPEs and MTEs and using the method of physical indicators; and (iii) foreign trade participation ratios (TPRs), defined as exports plus imports divided by GNP. Since the dollar values of CPE trade can be determined without using exchange rates, whereas each set of convertors will yield a different dollar GNP estimate, the TPRs will change, depending on the convertor employed.

10. Given the serious methodological and practical problems of obtaining reliable per capita dollar GNPs and growth rates (see below) for CPEs, in 1983, at the conclusion of this project, the Bank decided to discontinue publishing in the *Atlas* dollar per capita GNP and growth rates of CPEs except for those that are Bank members. In the case of Hungary, which joined the Bank and the IMF while our project was being carried out, the Bank decided to accept the country's prevailing unified exchange rate; in the case of Romania, a member since 1972, its commercial exchange rate continues to be used to obtain dollar GNP values.

11. Hungary's exchange rate yields unrealistically low dollar per capita GNP values ($2,060 vs $4,390 on the basis of our "adjusted PPP" method) because of certain peculiarities in its domestic price system and because the urgent need to improve its convertible currency trade balance had prompted a series of devaluations in recent years.

12. Estimates based on unadjusted PPP convertors yield even higher dollar per capita GNP statistic then our method. For example, the 1975 PPP computations of the International Comparisons Project (ICP) (also the basis for our computations before the ERDI adjustment) yield a 1980 per capita GNP of $5,964 (in 1981 dollars), according to the forward extension of the ICP number by Alton (in this volume, infra). These and earlier calculations by Alton (reported in previous Joint Economic Committee volumes on Eastern Europe and based on alternative PPP-type computations) are the basis of the dollar GNP data found in some U.S. government publications.

13. It should be noted that for some CPEs several PPP studies exist, using different benchmark years, price and quantity data sets, Western currencies to serve as links, methods of computation, and growth indices to move the estimates for a benchmark year forward. Thus, even "pure" PPP estimates differ from one another considerably. For Hungary, they tend to yield significantly higher dollar per capita figures than our estimates, and much higher numbers than those using the official exchange rate as convertors, bascially for the reasons mentioned in points 5 and 11.

14. Questions have been posed by members of Congress, U.S. Government agencies, and in the media about why the Bank chose to accept Hungary's official exchange rate, a convertor that yields the lowest dollar per capita GNP estimate and qualifies Hungary for World Bank loans as a less developed country. While only the Bank can explain its decision, the technical background was this. In recent years Hungary has introduced meaningful, market-oriented economic reforms. Although one should neither exaggerate nor understate what the reforms have accomplished so far (see the author's essay on Hungary's economic reforms in Volume 3), it is undisputable that since 1981 Hungary has maintained a unified dollar exchange rate which performs many of the functions that exchange rates do in a MTE. For example, the rate actually links foreign and domestic prices so that an exporter receives and an importer pays the actual foreign price converted uniformly to the domestic currency.

15. Given the fundamental differences between CPEs and MTEs (and among the CPEs) in methods of price and exchange rate determination, and the increasingly severe problems of data availability for several CPEs, there is one approach to estimating the per capita GNPs of CPEs which does not rely on prices and currency convertors: the physical indicators method. A detailed examination of the method and its results, its relatively simple data requirements, and the fact that it also yields internationally comparable growth rates suggest that the physical indicator method has much to recommend it. Regrettably, the United Nations, which pioneered this method, discontinued its use about ten years ago so that no up to date estimates of dollar per capita GNPs for CPEs were available for this project to consider as an option.

16. The official NMP growth rates of CPEs are calculated with prices that are distorted and according to methods of index number construction that tend to yield varying degrees of upward bias. The degree of bias is considered by independent experts to be so substantial for some CPEs as to lead to the conclusion that the official

NMP or the NMP-based GNP growth rates of CPEs taken as a group cannot be compared meaningfully with the GNP growth rates of MTEs.

17. CPEs rely on the double deflation method: both the value of gross output and the value of material purchases and depreciation are deflated by the relevant price indices. Gross value is typically overstated and the price indices used to deflate them are downward biased so that the resulting constant price series will be upward biased. The main reason why CPE price indices are downward biased is their method of introducing "new" products.

18. Prompted by these and other shortcomings in the official CPE growth statistics, considerable effort has been devoted in the West to develop alternative measures, using official data exclusively, but replicating as much as possible commonly accepted standards of valuation and index number construction in MTEs. The basic Western approach is to aggregate the official physical output series into branch, sector and GNP indices, using weights constructed from official data according to the adjusted factor cost standard pioneered during the 1950s by Abram Bergson, George F. Baker Professor of Economics at Harvard University. But for most CPEs the implementation of this alternative approach is hindered by gaps in published data that are very serious for some countries. Lack of published data on physical output for some branches often leaves no alternative but to rely on official "constant price" indices to estimate the growth rate of those branches, which tends to impart an upward bias to the recomputed indices also. A further problem is that the recomputed branch indices based on physical output may not measure adequately quality improvements and the introduction of new products, so that the resulting growth indices may be downward biased.

19. There was no consensus among the country experts in this project on whether the official or the independently computed growth rates would be preferable to use. The view that the official growth rates are significantly upward biased was unequivocal for all CPEs except Hungary; the country expert on Hungary was not certain. Most country experts, however, stopped short of endorsing the alternative growth computations, either because it is believed that those may be downward biased for the reason mentioned, but more often because they were not able to resolve satisfactorily concrete questions about the application of the method to their countries. For the USSR, the building-bloc data available from official sources, while not without gaps, was considered adequate because considerable resources were devoted to making the alternative estimates (which are well documented and evaluated against the official indices), and include sensitivity analyses in the sectors that present especially difficult statistical problems. These considerations led the country expert to prefer them unequivocally over the official series. The country authors on Czechoslovakia, the GDR, Poland, and Romania considered the recomputed Western indices more plausible but stopped short of endorsing their use until the questions they have raised about them are resolved. The adjustments to the official data made by the experts on Bulgaria reduced significantly the official growth rates but, in view of most members of the team, they are still upward biased. The country author on

Hungary leaned toward a preference for the official index at this time. The country authors on Cuba had insufficient data basis to recommend any set of growth statistics.

## II. ESTIMATING GNP IN NATIONAL CURRENCY UNITS

The national income accounts of CPEs record productive activity taking place on their territory rather than income received by their residents. Therefore, they are in the spirit of GDP rather than GNP.[4] However, since their balances of payments do not record large international factor payments, the difference between GDP and GNP is small and can be ignored for present purposes. The terms GDP and GNP are therefore used interchangeably.[5]

### *A. Alternative approaches*

There are four alternative approaches to estimating benchmark-year GNPs in NCU: (1) building a more or less complete set of national accounts from disaggregated data, computing GNP as the sum of value added in the production sectors—industry, agriculture, and the like; (2) scaling up from NMP to GNP on the basis of the average regression relationship found for a benchmark-year between NMP and GNP for a group of Western countries (the method employed by the World Bank *Atlas* between 1977–80); (3) scaling up from NMP by adding net value added in the nonmaterial sectors plus depreciation and making other adjustments necessary to bring the GNP estimates for CPEs comparable to those of market-type economies (MTEs), and (4) deriving GNP as the sum of the various end uses of the goods and services—consumption, investment, government, and net exports.

The first approach, building a set of national accounts from detailed data, has been relied on extensively in the West, with much of the effort focusing on the USSR (see works cited in [Campbell, p. 9], and some on the countries of Eastern Europe, principally [Alton 1981 and 1982]. The method involves developing an articulated set of accounts based on official production data aggregated according to some sort of factor cost valuation. In most of these calculations the results are identical with or very close to official CPE data for that portion of the total where the two approaches overlap (i.e., material production). However, the structure of an economy may be quite different, depending on the discrepancy between established and factor-cost prices. Although the results of such detailed computations are very useful and do provide important details and checks on alternative estimates, this approach is time-consuming, can be done only with a considerable delay, and estimates of approximately comparable reliability can be obtained, relatively simply for most CPEs, on the basis of other, so-called "shortcut" methods.

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[4] According to the System of National Accounts (SNA), GNP is a measure of the total domestic and foreign output claimed by residents of a country. At market prices, GNP includes compensation of employees, operating surplus, provision for the consumption of fixed capital (depreciation), and indirect taxes less subsidies to producers.

[5] To be sure, benchmark GDP estimates could be adjusted to obtain improved GNP estimates by subtracting interest payments on net external debt. Good estimates of the convertible currency portion of the debt and interest payments are available for all CPEs from Western sources, in dollars, but little information is known about the debt and interest denominated in rubles. Net interest payments in dollars could be converted to national currency units (NCUs) by using whatever coefficients are selected to convert GDP in NCUs to dollars. Illustrative computations by the country experts, however, show that net interest payments are small relative to GDP so that, as a practical matter, they may be disregarded.

The second approach, scaling up from NMP to GNP on the basis of an average relationship found for Western countries, is not recommended because it lacks a theoretical foundation. One would expect, for example, that because of differences in economic system as well as levels of development, the relative importance of the service sector would be smaller in CPEs than in the West European countries.

The third approach, scaling up from official NMP by adding net value added in the nonmaterial sectors plus depreciation is found to be a good practical method and was followed here for six of the seven CPEs for which GNP estimates could be made, Bulgaria being the exception. The main advantage of this method is its relatively modest data requirements. For countries for which clearly-defined data are available from official sources, the method is not too time-consuming because the adjustments needed to transform NMP to GNP are well documented in the literature.

The fourth method, estimating GNP as the sum of the end uses of all goods and services produced, was the one employed for Bulgaria because the sectoral production data available were insufficient to scale up to GNP from the official NMP figures. It was also used as a supplementary method for Czechoslovakia and the GDR.

None of these methods could be applied to Cuba because no comprehensive, reliable, and up-to-date statistical information could be obtained or reconstructed on that country's NMP or GNP [Mesa-Lago and Perez-Lopez].

### *B. Main problems of GNP estimation from NMP*

CPE national income accounts are based on the material production system (MPS), whose most important aggregate is NMP, its derivation fairly standardized. The NMP covers comprehensively value added in the "material" sectors of production, typically representing between 70 and 80% of GDP. The consensus of experts is that NMP can be taken as a point of departure for estimating total GNP for a benchmark year but not GNP components or growth rates, for reasons that will be indicated.

Even when scaling up NMP to estimate total GNP, official NMP data has to be assessed, and if necessary, adjusted for statistically significant problems of individual country deviations from "standard" MPS, the inclusion of certain services in "material" production, varying treatment of the foreign trade sector and for other reasons, as documented in [Marer 1982, para. 54-64].

Valuation is also a very important problem. In CPEs, prices are established administratively and satisfy neither the factor cost standard, which best reflects production potential, nor the welfare standard, which mirrors most accurately the contribution of goods and services to welfare. But if the goal is to end up with a figure for total or per capita GNP valued in dollars, then distorted domestic prices will not be a serious problem if the most usable NCU/dollar conversion coefficient is based on established prices. In this case, all component of GNP should be valued at established prices rather then at prices adjusted to a factor cost or some other standard. Moreover, relative high prices put on certain goods or sevices mean, by definition, relative low prices placed on other items. One problem, however, may be the inconsistent methods of imputations used to account for production that takes place outside the normal buyer-seller relationships and, hence, does not have any monetary value assigned to it. In CPEs, the prime categories are agricultural production consumed in kind and the rental value of owner-occupied housing. Countries are not always consistent in valuing these activities at prices at which equivalent goods or services are sold. If known, such problems are flagged in the project's country studies cited in the bibliography, but it has not proved possible to make comparable adjustment for all countries.

### *C. Scaling up from NMP to GNP*

The first step is estimating the contribution of the nonmaterial sectors. The usual procedure is to begin with published figures on employment, average wages, and wage-type (social security) taxes to derive the wage bill, then add operating surplus in the form of profits and other types of accumulation, as reported or as can be best estimated. The operating surplus component is usually the most difficult to obtain, so on this item estimates can differ by wide margins, though it is more likely to be under than overstated.

Estimating the value of housing services is also highly problematic, first, because an imputed value must be assigned for the services of privately-owned housing and, second, because a decision must be made what value should be put on housing, both public and private. In the case of the USSR, the country expert applied the average (highly subsidized) rent in state housing to an estimate of the stock of private and cooperative housing [Campbell, pp. 16–19]; in the case of Hungary, the CSO estimated the contribution of public and private housing services on the basis of cost, i.e., adding the subsidies, though excluding operating surplus [Central]. Conceptually the first approach is correct, for reasons indicated when discussing valuation. For the other countries, procedures roughly comparable to one or the other method was followed, as can best be determined.

The second step is estimating depreciation, very difficult to establish, both conceptually and in practice. The key conceptual questions are how depreciation should be computed and what should be the coverage of the assets on which it is to be charged. The simplest and most satisfactory method would be to apply established depreciation rates to capital stock valued in current prices to get around the difficult problem of the meaning of depreciation series obtained from enterprise balance sheet data, which reflect the changing acquisition prices of assets. However, as a practical matter, this is not how it is usually done. The estimates for the countries are based on depreciation amounts published, the amounts often reported without detailed explanation. Concerning coverage, SNA conformity requires that depreciation on the capital assets of budgetary organizations be excluded, while depreciation on collective farm assets and on privately and cooperatively-owned housing be added because official data may not include it. Further problems include that in some countries published depreciation has two components: a portion intended to finance capital repair and a portion to recover the original value of an asset. The former should be considered an intermediate product and disregarded. But if a country using this method does not report the components separately, or if no explanation is given on how the depreciation was computed, the depreciation estimate could be biased. It was surprising to find, therefore, that the share of depreciation in the GNPs across the CMEA countries did not vary a great deal, ranging from the low of 8.6% to a high of 12.9% (no data for Bulgaria), so that even, say, a 25% error in depreciation would bias the GNP estimate by less then 3%.

### *D. Main findings and confidence in the estimates*

The NMPs and GNPs in NCUs of the seven CMEA countries for the benchmark year 1980 are presented to Table 1. The country experts carried out alternative GNP computations whenever it was necessary to check their estimate and was possible to do so (e.g., Czechoslovakia, the GDR and Poland). Each evaluated its GNP estimate and the resulting GNP/NMP ratio against whatever comparable figures could be found in the publications of the country (which in many cases showed only the end results of computations) and against estimates prepared outside the country.

The degree of confidence the country experts place in the GNP estimates shown in Table 1 range from "high" for Hungary (the only CMEA country whose central statistical office (CSO) routinely publishes well-documented GDP computations and has worked with the CSO of France on a joint, practical reconciliation of the two countries' SNA and MPS accounts), "good" for the USSR and Czechoslovakia (probably with ±5% error margin), "somewhat problematic" for Poland, Romania and the GDR (probably within ±10%), to "problematic" for Bulgaria (error margin may exceed ±10%). The main problems in the case of Poland and Romania are uncertain definitions and incomplete data to adjust NMP, plus the fact that 1980 was already a year of some upheaval in Poland. For the GDR, and additional problem is its treatment of foreign trade because a significant bias probably results from its apparent disregard of "special earnings on foreign trade." For Bulgaria, the main problem is the almost complete absence of data on non-material services needed to scale up NMP (whose calculation apparently follows the standard MPS method, except in foreign trade), forcing the country experts to estimate GNP from highly aggregated end-use components whose coverage and valuation could not be checked. One possible reason for the high GNP/NMP ratio for Bulgaria is that the depreciation is charged on replacement value rather than cost, unlike the other countries, so depreciation could be significantly higher.

## TABLE 1.—NMP AND GNP OF SEVEN CPES AT CURRENT ESTABLISHED PRICES, 1980

[Billions of national currency units and percent of GNP]

| Item | Hungary (forint) |  | Romania (lei) |  | USSR (ruble) |  | Czechoslovakia (kcs) |  | Poland (zloty) |  | German Democratic Republic (mark) |  | Bulgaria (leva) |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Units | Percent | Units | Percent | Units | Percent | Units | Percent | Units | Percent | Units | Percent | Units | Percent |
| NMP | 581 | 80.8 | 516.6 | 83.3 | [1] 458.5 | 77.8 | 474.9 | 84.5 | 1,956 | 78.2 | 187.1 | 85.7 | 20.509 | 75.7 |
| Adjustment | [2] −24 | −3.3 | [2] −18.0 | −2.9 | [3] +14.5 | +2.5 | [4] −36.5 | −6.4 | [2] −20 | −0.8 | [3] −20.3 | −9.3 | NA |  |
| Adjusted NMP | 557 | 77.5 | 498.6 | 80.4 | [1] 473.0 | 80.2 | 438.4 | 78.1 | 1,936 | 77.4 | 166.8 | 76.4 | NA |  |
| Nonmaterial sectors | 69 | 9.6 | 61.2 | 9.9 | 65.9 | 11.2 | [6] 62.1 | 10.3 | 286 | 11.4 | 24.1 | 11.0 | NA |  |
| Housing (Including imputed rent) | NA | ........ | ........ | ........ | [5] (4.2) | 0.7 | (16.2) | (2.9) | ........ | ........ | (3.4) | (1.6) | ........ |  |
| Housing, communal and others | NA | ........ | (8.3) | (1.3) | (10.5) | (1.8) | ........ | ........ | (33) | (1.3) | ........ | ........ | ........ |  |
| Depreciation | 93 | 12.9 | 60.1 | 9.7 | 50.6 | 8.6 | 65.6 | 11.7 | 280 | 11.2 | 24.0 | 11.0 | NA |  |
| Material sectors | ........ | ........ | (52.0) | (8.4) | ........ | ........ | (50.2) | (8.9) | (243) | (9.7) | (22.6) | (10.4) | ........ |  |
| Nonmaterial sectors | ........ | ........ | (8.1) | (1.3) | ........ | ........ | (15.4) | (2.7) | (37) | (1.5) | (1.4) | (0.1) | ........ |  |
| GNP, total (billions) | 719 | 100.0 | 619.9 | 100.0 | 589.5 | (100.0) | 566.1 | (100.0) | 2,502 | (100.0) | 218.3 | 100.0 | [8] 27.105 | −100.0 |
| GNP, per capita | 66,859 | ........ | 27,838 | ........ | 2,211 | ........ | 36,913 | ........ | 69,878 | ........ | 13,000 | ........ | 3,009 |  |
| Ratio: GNP/NMP | 1.24 | ........ | 1.20 | ........ | [7] 1.25 | ........ | 1.19 | ........ | 1.28 | ........ | [9] 1.26 | ........ | [6] 1.32 | ........ |

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[1] Includes considerable amounts of what is really intermediate product that should be netted out, e.g., services sold to material sectors, geological exploration, land melioration, fire protection, R&D [Campbell].

[2] Non-material services purchased by the material sectors.

[3] Non-material transport and communication (9.2 bill. wage bill. +5.3 bill. operating surplus).

[4] Sum of payments for non-material services in the material sector of 22.3, material cost of business travel of 5.9, transfers to the non-material sector of provision of free services for employees of 6.3; and losses on stocks of 2.0.

[5] Housing valued at established prices: 2.5 bill. rent on state-owned (1.7 bill. sq. meter x 1.47 rubles) + 1.7 bill. imputed on privately owned [Campbell].

[6] Estimate based on components of GDP utilized at market prices, which differs from the GDP estimate for other countries scaled up from NMP at established prices because of the distorting effect of subsidies and indirect taxes on consumption.

[7] The ratio is calculated using "Adjusted NMP" to make the definition comparable to the NMP's of the other countries (see notes 1 and 4).

[8] Subtract intermediate services to material production of 3.7, retail price and rental subsidy adjustment to keep valuation consistently in market prices for which PPP have been computed of 18.1 and add capital repairs of 1.5.

[9] Ratio of GNP at purchase prices (i.e., before the retail price and rental subsidy adjustment) of 236.4 to NMP at current prices of 187.1 [Collier, table XII].

Sources. GNP and components: Hungary: [Central . . .]; Romania: [Jackson, Revised, table 24]; USSR: [Campbell, Table 6]; Czechoslovakia: [Havlik and Levcik, Tables 1, 2, 7 and 12]; Poland: [Fallenbuchl, Table I–8, Version A]; GDR: [Collier] Table XII; Bulgaria: [Singh and Park, Table 4 and revised Appendix 2]; GNP per capita: Total GNP divided by mid-1980 population given in the 1981 World Bank Atlas.

For six of the countries, excluding Bulgaria, the 1980 GNP/NMP ratios ranged from 1.19 for Czechoslovakia to 1.28 in Poland, 1.24 being the average. Poland's ratio may be relatively high in part because the amount subtracted from NMP non-material services purchased by the material sectors is low (.8% of GNP vs 3% to 4% for the other countries), and partly also because the ratio increases rapidly during an economic downturn and declines during rapid expansion, since the business cycle affects material production more than nonmaterial production [Fallenbuchl, pp. 28–29].

For all of the East European countries, the GNP/NMP ratios are significantly lower than those obtained by independent Western estimates based on building a complete set of national accounts from disaggregated data, namely those published by the Research Project on National Income in East Central Europe (RPNI), as shown in [Alton 1982], due importantly to the latter's factor-cost imputations on housing and returns to land.

## III. ESTIMATING GNP IN DOLLARS

### *A. Alternative approaches*

There are four main sets of alternative approaches to estimating the GNP of a CPE in U.S. dollars: (1) employing one of the prevailing official exchange rates or exchange-rate-type coefficients; (2) relying on estimated purchasing power parities (PPP) as convertors; (3) scaling the PPP estimates to "proxy exchange rate levels" and using them as convertors; and (4) the physical indicators method, which estimates GDP of GNP directly in U.S. dollars. A brief discussion of these approaches as well as the advantages and disadvantages of each is summarized next.

#### *1. Exchange rate type convertors*

Traditional CPEs are characterized by comprehensive government controls over domestic price formation and resource allocation; exchange rates play a largely passive role. There is a sharp dichotomy between domestic prices and prices actually observed in foreign transactions. Also, there is a dual system of producer (wholesale) and consumer (retail) prices whose levels and structures are kept apart by varied taxes and subsidies. For information, accounting, and planning purposes, CPEs tend to use a plethora of exchange rates and exchange-rate-type coefficients, but there is no need to peg or maintain them at "proper" or "realistic" levels, and usually they are not.

Beginning in the 1960s, some CPEs began to introduce economic reforms. These often involved reductions in the number of exchange rates or coefficients, setting them at more realistic levels, and starting to use them as policy instruments in ways that in some respects resembled their use in MTEs. However, most exchange rates are still tailored to specific types of transactions.

The main exchange rates and exchange-rate-type concepts found in CPEs are: official exchange rates; internal exchange rates (IER); foreign trade multipliers (FTM); commercial exchange rates; and noncommercial (tourist) exchange rates Several other types of conversion coefficients may also be found in some CPEs, such as the exchange rates used in foreign currency shops, for private remittances, and of course the black market rates. These are described briefly in [van Brabant]; they are not directly relevant for GNP conversion to dollars. Only exchange rates vis-a-vis convertible currencies are discussed; information on intra-CMEA exchange rates can be found in [van Brabant].

### *(i) Official exchange rates*

All CPEs established the gold parity of their currencies during the early postwar period and set the dollar exchange rates on that basis. The precise reasons for setting the gold parities remain obscure and sources differ in their explanations. But at least in some cases gold parities were set to yield exchange rates to help achieve equilibrium in external payments or to reflect the PPP of the currency. But even if a country's initial exchange rates were so determined, after traditional central planning was introduced, prices were then set and changed independently of price movements in other countries. Thus, the official exchange rates of CPEs became arbitrary and unrealistic relative to the standards according to which the exchange rates in MTEs are evaluated. The rates remained unchanged during the 1960s also, except in the USSR and Bulgaria where new rates were introduced in 1961 and 1962, respectively. The response of the CPEs to the dollar devaluations of 1971 and 1973 and to the subsequent floating exchange rate system was unsynchronized. Most countries appreciated their official rates after 1971 and 1973 and then pegged first to the dollar and more recently to an individually determined basket of currencies. Poland and Romania kept their 1973 rates unchanged until 1978, the GDR until 1979. During the past few years CPEs gradually switched over to frequent (monthly, biweekly or weekly) exchange rate quotations against the main convertible currencies, with the GDR and Romania being the exceptions. The official exchange rates of the individual CMEA countries, annually since 1970, is shown in Appendix Tables 1 through 9.

These technical details should not obscure the fact that after central planning was introduced, the official exchange rates of the CPEs became, and many still remain, arbitrary, notional rates without much economic content or practical significance. The first CPE to depart significantly from this pattern appears to have been the USSR, whose new official exchange rate, set in 1961, was apparently determined on the basis of the ruble's PPP against the dollar. The USSR employs this same rate for noncommercial (i.e., tourist) transactions also, but otherwise the exchange rate still has little significance for economic decisions. Since the late 1960s, several East European countries have carried out exchange rate reforms of various kinds which have had lesser or greater significance for their economic decision making.

### *(ii) Internal exchange rates*

Foreign trade transactions effected in external prices and converted to NCUs at the official exchange rate yield "devisa" (or "valuta") national currency values, which differ from the values of the same transactions evaluated at domestic prices. The internal exchange rate (IER) is a coefficient that relates ex post the domestic wholesale price of traded goods to their "devisa" price (i.e., the foreign currency price converted at the official exchange rate). The IER is typically computed separately for exports and imports and disaggregated by trade partner (e.g., socialist vs. nonsocialist) and commodity groups. The IER is not always an annual number; sometimes it is computed as a multi-year average and the year for which it is published may not be the year for which computed. Regrettably, no CPE publishes its IERs.

### *(iii) Foreign trade multipliers*

The FTM is a coefficient that relates ex post the domestic wholesale price directly to the foreign currency price, i.e., it is a proxy exchange rate. Thus, once the IER is known, the FTM can be easily calculated by multiplying the IER by the official exchange rate. However, since the FTM relates domestic wholesale prices to foreign price obtained or paid in the country's external trade transactions, it cannot be used for converting local currency GNP, which is not evaluated in wholesale prices. Once computed, the FTM, too, may remain unchanged for years, although in some cases it will be adjusted to reflect changes in the official exchange rate, which in turn are generally based on changes in the external value of the dollar in terms of other convertible currencies. Thus, similarly to the IER, the FTM reflects accurately the ratio of domestic prices to dollar foreign trade prices only in the base year. If the FTM were to be used as a conversion coefficient, it too should be adjusted for changes since the base year in domestic and foreign trade prices. If the IER and the FTM have the same base year, then the IER multiplied by the official exchange rate yields the FTM; in other years that relationship holds only as "more or less" valid. Most CPEs do not publish a time series on their FTMs; those that do are shown in Appendix Tables 1–9.

### *(iv) Commercial exchange rates*

Three CPEs quote commercial exchange rates publically: Romania since 1973, Hungary since 1976, and Poland since 1980 (Appendix Tables 9, 7 and 6, respectively). At the time they were introduced, in Romania and Hungary rates rates were based directly on the FTM; in Poland, on the FTM plus a fixed premium. At the time the commercial exchange rates were introduced, they reflected some realistic ratio between domestic wholesale and foreign trade prices for the pattern of trade prevailing with the socialist and nonsocialist groups of countries, respectively, in the base year. Thus, initially, the commercial exchange rate may in fact be calculated the same way as the FTM. However, in countries where trade decisions are partly decentralized, the commercial exchange rates, as introduced or as subsequently changed may be raised (i.e., more NCUs per dollar) to help improve the balance of payments. Since the floating of Western currencies, the three CPE's commercial exchange rates vis-a-vis Western currencies are changed periodically to reflect movements in the value of the Western currency basket to which the CPE currency is tied; in addition, a CPE's commercial exchange rates may be altered for policy reasons also.

### *(v) Tourist (noncommercial) exchange rates*

Noncommercial exchange rates are used mainly for tourism, personal remittances and certain other invisible transactions. The rates may be published as official noncommercial exchange rates or as premia or surcharges on the official exchange rates (Appendix Tables 1-9). They are often defined ambiguously and rarely applied uniformly to all persons and type of transactions (for example, the residents of some countries may have to pay as much as 150% more to obtain convertible currency for tourism than the rate given to Western tourists). Nonetheless, even in a CPE the noncommercial exchange rate for Western tourists must approximate in some rough and ready way the PPP of the country's currency for a tourist basket of goods and services. Such computations indeed are said to serve as points of departure for determining the rate in a base period, though the rates may not be set at the PPP level. This is because political and economic attitudes toward Western tourists will influence the rates: favorably if the country wants to encourage, and unfavorably to discourage the inflow of Western tourists. Bulgaria, Hungary, Poland and Romania appear to provide "incentives," while Czechoslovakia, the GDR and the USSR offer no incentives, possibly even disincentives, to Western tourists. Moreover, a fixed commercial exchange rate may gradually become an incentive or a disincentive rate if domestic and foreign price levels and ratios change significantly.

As to using the tourist rate for GNP conversion: even if a country's non-commercial exchange rate were set to reflect the PPP of a tourist basket of goods and services, it would not be the appropriate rate for GNP conversion, first, because the expenditure patterns of tourists are very different than those of residents and, second, because the retail prices of goods and services need not have the same relationship to wholesale prices in CPEs as in MTEs, as will be discussed.

### *(vi) Why exchange rate type convertors are problematic*

The above brief discussion of the exchange rates and exchange-rate-type coefficients of CPEs indicate the following conclusions:

First, many CPEs have a bewildering variety of exchange rates and related concepts; in effect, they have multiple exchange rate systems. Do CPEs have one exchange rate or exchange rate proxy whose concept is clear, how the rate is determined in practice is well understood, and which would be appropriate for converting their GNP to dollars? If the CPEs are taken as a group, the answer is negative. The official exchange rates, clearly, cannot be considered. The tourist rates would also be problematic. There is insufficient information on how they are determined; evidence suggest that they do not necessarily approximate the PPP of consumer goods and services. For example, since 1961 the USSR has adjusted its single exchange rate only to follow the changing international exchange rate of the dollar but not to account for substantial differences in Western and Soviet rates of inflation. Bulgaria has moved the rate up and down, to all appearances somewhat arbitrarily. The GDR always quotes the Federal Republic's DM/$ rate as if it were the same as East Germany's mark/$ rate, even though retail prices move differently in the two countries. Hungary has recently depreciated the tourist rate by 100% in less than three years for reasons unrelated to changes in relative price levels. Romania kept the rate fixed or six years even though its inflation rate was significantly lower than those of its trade partners.

To be sure, none of these situations is unique to CPEs. The main point, however, is that there is uncertainty on what the tourist rates mean and great divergence of practice in its calculation. Moreover, even if the rates reflected accurately the PPP of a tourist basket, their use for GNP conversion would not be appropriate if the CPEs set the prices of the other components of GNP relative to the tourist basket differently than MTEs. The conclusion that the tourist exchange rate is not the uniformly appropriate rate to use for GNP conversion does not preclude the possibility that for this or that country at one or another time the tourist rate might yield "reasonable" dollar GNPs.

The commercial exchange rate—or its proxy, the FTM—would seem to be a better candidate as conversion coefficient. First, we know what it measures and how it is calculated. Second, in some ways it is like an exchange rate in a MTE in that it equates the domestic and foreign prices of some traded goods, namely those of exports (in some countries, also of some imports). However, the exchange rate of a MTE without pervasive trade and exchange controls would approximately equate the domestic and foreign prices of all tradables, not just exports. This is not the case in CPEs where the domestic prices of imports may be significantly higher or lower then the actual import price multiplied by the commercial exchange rate or the FTM. For example, in the USSR in recent years imports have been priced two to three times higher than exports; in Romania, in 1980 exports were priced 23% higher than imports. By contrast, as of January 1, 1980, Hungary had introduced a system in which the user of imports pays the actual cost of imports and Poland moved toward such a system as of January 1, 1982, except for important raw materials and intermediate products. The other CPEs apparently are more like the USSR and Romania.

A further very important problem is that the value of a FTM-based commercial exchange rate will be strongly influenced by the composition of exports. If a CPE exports manufactures and agricultural products, it will face considerable difficulties selling these in the West at internationally competitive prices because of problems of quality and service, lack of brand name, poor marketing, need to fulfill the plan so that the exporter may not have full control over the timing and direction of its sales, and, very importantly, because of Western discrimination, which will depress the export price further. Moreover, since many CPEs tend to obtain much of the operating surplus the government needs largely from industry by setting relatively high prices for industrial products and relatively low prices on raw materials, agricultural goods and on many consumer items, this will increase further the FTM for CPEs with a high share of manufactured exports. Thus, for such countries in particular, the commercial exchange rate (or FTM) will undervalue considerably their currencies so that their use for GNP conversion will introduce a significant downward bias in the resulting dollar GNP as compared with the dollar GNPs of MTEs.

By contrast, CPEs selling to the West mostly energy and raw materials will have no difficulty marketing their products competitively, so the dollar price will not be depressed. Moreover, the domestic prices of these goods typically are set relatively low. Thus, their FTMs will be comparatively low. The conclusion, therefore, is that using the commercial exchange rate, or its proxy, the FTM, would not yield per capita dollar GNPs that are uniformly comparable among the CPEs or between CPEs and MTEs. And as a practical matter, commercial exchange rates are available only for three CPEs and are unavailable for the USSR, Bulgaria, Czechoslovakia, and the GDR.

Third, the exchange rates of most CPEs do not reflect a continuously realistic relationship between domestic and foreign prices of selected transactions even if the rates did reflect correctly the indicated relationship when initially determined.

The main conclusion is that none of the exchange rates or coefficients commends itself as the appropriate one for GNP dollar conversion for *all* CPEs. Whether any particular rate may be acceptable for one or for a subgroup of CPEs for converting GNP, or a component of GNP, must be determined on an individual country basis.

### *2. Purchasing power parities*

The most significant PPP study involving both CPEs and MTEs employing a uniform methodology is the International Comparisons Project (ICP). In its latest (third) phase, the ICP included detailed PPP computations for 1975 for GDP and components for Hungary, Romania, and Poland, along with 30 MTEs plus Yugoslavia. Mention should be made also of the PPP computations for consumer goods and services routinely carried out by the CSO of the Federal Republic of Germany for 60 countries, including Hungary, Poland, Czechoslovakia, and the USSR; and the UN's cost of living comparisons between New York City and cities in more than 100 countries where UN personnel live, including Bulgaria, Czechoslovakia, Hungary, Poland, Romania and Cuba; and bilateral PPP comparisons between individual CPEs and MTEs. A brief discussion of these approaches follows next.

### *(i) The International Comparisons Project [ICP]*

*a. General methodology.*—The purpose of the ICP was to devise a method for comparing the GDP and GDP components of countries more reliably than those resulting either from exchange rates conversions, or from bilateral PPP comparisons where the resulting dollar values (and the cardinal ranking of countries) is partly a function of the reference country chosen and its dollar exchange rate with the numeraire country, usually the U.S.

The ICP's approach is to obtain quantity comparisons by means of price and expenditure comparisons. GDP in NCUs is divided into 151 expenditure categories. In each, price comparisons are made for carefully specified goods and services. The price data are established jointly by each country's CSO and ICP whose standardized item specifications are priced after taking quality into account, sometimes after inspection of items in shops, testing of samples, and correspondence with the authorities to resolve queries. A key innovation is the computation of "international prices"—quantity weighted averages of detailed PPPs—so that category quantities (obtained by dividing category PPPs into category expenditures) can be summed to get total GDP or any of 151 subaggregates. The "international dollar" has the same purchasing power over the US GDP as a whole as the US dollar but its purchasing power over individual categories is different, determined by the structure of international prices.[6]

*b. ICP's alleged bias for CPEs.*—The ICP's PPP results for Hungary, Poland, and Romania are shown in Appendix Tables 6, 8 and 9, respectively. Many experts from the East European countries as well as others believe that the ICP results are strongly biased, that is, that the ICP yields fewer NCUs per dollar than it should, so that the resulting dollar per capita GDPs are upward biased. There are said to be two main reasons. First, in the view of the ICP's critics, it did not take sufficiently into account the relatively poor quality and availability of CPE products and services. Second, the price inputs were based mainly on official price lists and on the prices of goods sold in state retail outlets at fixed prices. In reality, a certain percentage of goods are sold, especially in the consumer sector, at much higher prices on the officially sanctioned free and the illegal black markets. The results of bilateral PPP computations, such as those between Austria and Poland, yield NCU/$ ratios significantly higher than the ICP because they are said to reflect more accurately quality differences and because, it is claimed, the comparisons involved much greater detail and effort. Others note that even though these arguments might have merit, one must be cautious in making quick judgments about any kind of bias. But in any event, the issue is whether there is a bias relative to many less- and moderately-developed MTEs.

Professors Kravis and Heston, two of the principal architects of the ICP, explained during the workshops (held in connection with the implementation of this project) the safeguards that were built into the ICP precisely to avoid the kinds of biases the ICP is charged with. First, the ICP's product specialists had many years of experience in a large number of countries on the basis of which to make informed judgments about the technical parameters and the quality of a CPE's products. Second, the prices were supplied by the authorities of the CPEs themselves, therefore it is not fair for them to argue that either the price or expenditure data incorporated are biased.

Regarding the question of the quality of CPE products and services, it was pointed out by other workshop participants that, for systemic reasons, the goods and services produced in CPEs tend to have technical and quality shortcomings that may not be readily apparent upon first examination even to an expert. Moreover, specialists from the CPEs knowledgeable about the details of their country's participation in the ICP pointed out that at the time the data were gathered there may have been a tendency on the part of their experts to answer questions calling for judgment (such as whether a product should be considered high, medium, or poor quality) in such a way as to introduce an upward quality bias, basically for reasons of national pride. Moreover, when the data for the ICP was gathered, between 1970 and 1975, the environment, at least in some countries, was to endorse tendencies stressing the country's economic achievements and understating its problems. This may have worked to re-enforce the "national pride" bias. To put it bluntly, at the time the authorities were unaware of how all of this could backfire if the results of the ICP computations were to be used to establish dollar per capita GDP levels.

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[6] An especially difficult problem was the international comparison of education, health care, and government. Alternative ways of valuing these services were tried which, while often yielding substantial differences in the quantity comparisons, had only a small impact on overall GDP estimates.

It has also been pointed out that to the experts from CPEs the ICP procedures were like a "black box": they answered the questions put to them but had no opportunity to discuss the preliminary results and computation procedures until years later, when presented with the final results, by which time it was difficult for them to put their fingers on the precise source of the bias, both because of the long interval between supplying the data and obtaining the results but also because of the unfamiliarity with what they viewed as complicated data processing and manipulating procedures.

### *(ii) Bilateral purchasing power computations*

PPP-based comparisons with MTEs have been computed for the USSR (vis-a-vis the U.S., both in the USSR and in the U.S.), for Czechoslovakia vis-a-vis Austria (by this project's country experts), for the GDR (vis-a-vis the Federal Republic of Germany, by this project's country expert), and for Poland (vis-a-vis Austria, by the CSOs of the two countries). The main results are presented in Appendix Tables 1 (USSR), 3 and 4 (Czechoslovakia), 5 (GDR), and 8 (Poland); details on these computations can be found in [Marer 1985, section IV–D] and in the country studies cited in the bibliography.

### *(iii) West German comparisons of living costs*

Since the mid-1950s, the CSO of the Federal Republic of Germany has calculated the PPP of the DM against the currencies of about 60 countries, for a standardized basket of consumer goods and services. Valuation tries to take cognizance of quality differences between the German and the surveyed country's products [Internationaler]; how often the sample is changed and repriced is not indicated. Since the most probable purpose is to make cost-of-living comparisons for "post allowances" to diplomats in the various countries, and since embassy personnel rather than manpower skilled in making such comparisons are used, the results are likely to have wider error margins than those obtained by the ICP. The USSR, Czechoslovakia, Hungary and Poland are the CPEs covered; the results are shown for the individual CPEs in Appendix Tables 1, 3, 6, and 8, respectively.

### *(iv) UN comparisons of living costs*

The UN periodically surveys the cost of living in New York City and in more than 100 cities around the world for a basket of goods and services typical of the pattern of consumption of UN personnel [Monthly]. Two indices are computed, one including, the other excluding housing. Because the basket is different from that of the indigenous population in the countries surveyed, and because New York City prices are not fully representative of US prices, the indices will not reflect accurately the relationship between consumer prices in the US and in the surveyed countries. Cities in Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Cuba have been included in the survey; the results are shown in Appendix Tables 2, 3, 6, 8, and 9, respectively.

### *(v) Why purchasing power parity convertors are problematic*

There are two set of issues concerning the use of PPPs for converting the GNP of CPEs to dollars. One is the coverage and methodology of the different estimates, the other is whether PPPs would be appropriate to use, given that for MTEs their GNPs in dollars are computed by using their prevailing exchange rates, not PPPs obtained through the ICP or any other method.

Regarding the coverage and methodology of PPP computations for CPEs, the consensus was that mainly because the coverage of both the West German CSO's and the United Nations comparisons of living costs were too limited and both exclude several European CMEA countries, this makes their results inappropriate as GNP convertors. At the same time, their computations provide information helpful in interpreting the results of other PPP computations. By contrast, the coverage of the ICP and of several of the bilateral PPP computations encompasses all of GDP and computations for a relatively recent year are available for six of the seven European CMEA countries (Bulgaria is the exception). Regarding their methodology of computation, the consensus of the independent experts in this project was that it will not be possible for the group to resolve the debate or to quantify the ICP's presumed bias. At the same time, it was also concluded that the ICP's results for CPEs, together with the results of bilateral PPP computations whose methods are comparable in a rough and ready way with that of the ICP, do yield meaningful convertors. A key consideration was that PPP-based convertors are obtained on the basis of similar methodologies not only for the CPEs but also as between the CPEs and MTEs. Although PPP computations are not without shortcomings, given the difficulties with the use of exchange rate based convertors, the consensus of this project's experts was to recommend the use of PPP-based convertors for CPEs.

Regarding the second issue, that the dollar GNPs of MTEs are obtained using as convertors each country's prevailing exchange rates not PPPs, we realized that this makes the use of PPP convertors for CPEs problematic.

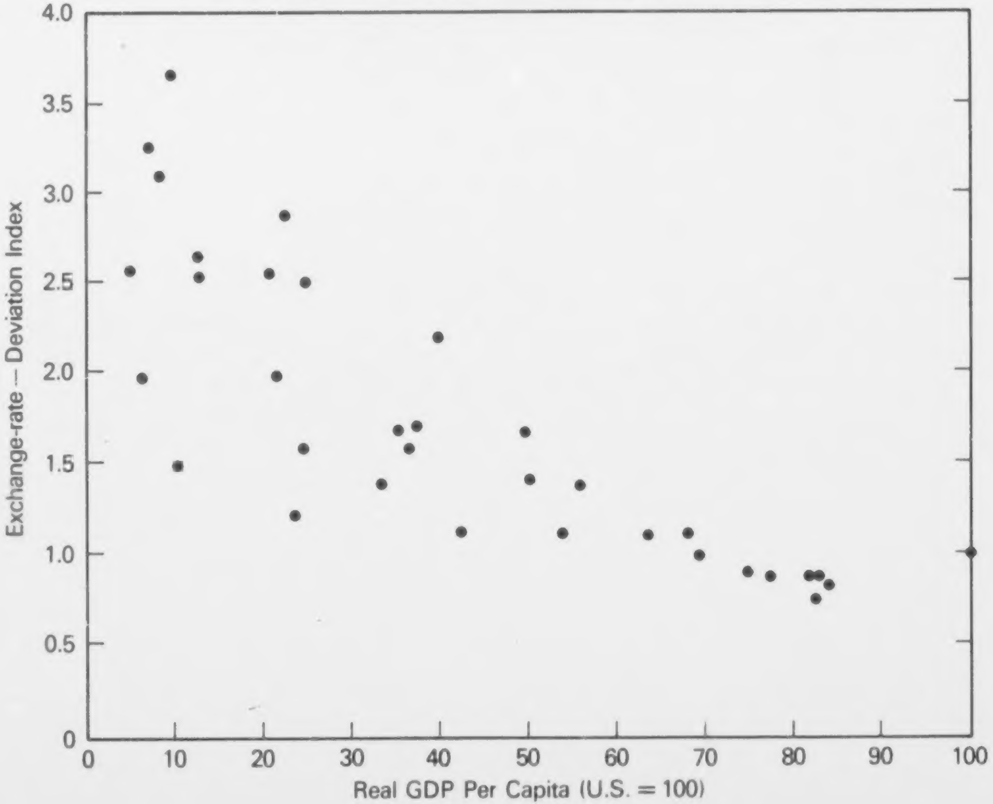
There are several reasons for the Bank continuing to use the prevailing exchange rates for MTEs. One is that in 1982 benchmark ICP results were available only for 34 countries, whereas comparable conversion coefficients are needed for all countries. Although short-cut estimates are available for most countries [Kravis et al.—1982], they rely on the availability of exchange rate converted GNPs, which poses an insurmountable difficulty for their application to CPEs. The fact that the ICP comes up with significantly smaller dispersion in total and per capita real incomes in dollars between the less developed and the more developed countries than in the case of conversion based on exchange rates is also a factor. Not all countries endorse a method that might graduate them from lower to higher per capita income categories, with possible implications for preferential tariff positions and concessionary loans from international organizations.

### *(vi) Relationship between purchasing power parities and exchange rates*

There is a systematic relationship between the PPP-converted and the exchange-rate-derived dollar GDP, which appears to be largely a function of the per capita GDP levels of countries, as shown in Figure 1. The vertical axis in Figure 1 is the ratio of the exchange rate to the PPP, called the exchange-rate deviation index (ERDI). An ERDI greater than 1 means that the exchange rate is "higher" than the PPP (so that the real value of the country's currency is higher in terms of PPP than in terms of its exchange rate). Thus for a country with an ERDI greater than 1, conversion of its GDP to dollars via PPP will yield a higher dollar figure than if its exchange rate were used. More generally, the higher the PPP or the exchange rate, the lower the resulting dollar GDP and vice versa.

Figure 1.

Exchange-rate — Deviation Index in Relation to Real GDP Per Capita, Thirty-four Countries, 1975



The authors of the ICP interpret the relationship between the ERDI and real per capita GDP shown in Figure 1 largely in terms of the differences in the productivity gap between high- and low-income countries for tradable and nontradable goods. That is, international commodity arbitrage tends to drive the prices of similar tradable goods toward equality in different countries. With equal or nearly equal prices, wages in tradable goods industries in each country will be determined by productivity; similar wages will prevail in each country's nontradable goods sectors also. In nontradable goods industries, however, international productivity differentials tend to be smaller. Consequently, in a high-productivity country high wages lead to high prices of nontradable goods, whereas in a low-productivity country low wages give rise to low prices of services and other nontradables. The lower a country's income, the lower will be the prices of its nontradable goods and the greater will be the tendency for exchange-rate-conversions to underestimate its real income compared with that of richer countries. By contrast, valuing nontradables at international prices or in the prices of a higher income country (as in bilateral PPP comparisons), will tend to increase the real income of the poorer countries as compared with those of the richer countries [Kravis, et al. 1982, pp. 11–14].

Some have questioned the empirical validity of this explanation, others suggested that several factors are likely to determine the ERDI of a country. Wolf, for example, has shown that even if the exchange rate of a MTE were an equilibrium rate from the point of view of the balance of payments, there would still be many reasons for the exchange rate to deviate from PPP, including differences among countries in (1) the relative prices of nontradables; (2) expenditure weights; (3) the terms of trade; and (4) explicit or implicit trade taxes [Wolf—1982, Section II]. More recently, it has been shown also that the degree of openness (trade turnover divided by GNP), which is positively correlated with income levels, may be an explanation of the relationship between the ERDI and per capita GNP depicted in Figure 1 [Wolf—1983, p. 10].

The conclusion is that even though exchange rates may only be second best to PPPs, since the World Bank and other international organizations will continue to employ them to convert GNPs to U.S. dollars, the aim here must be to find proxy exchange rates that would be appropriate for comparability between CPEs and MTEs. If one could ascertain empirically the relative importance of the factors determining the ERDI for MTEs, one could use an equation to calculate a "comparable" ERDI for CPEs. Unfortunately, the casual relationships have not been fully established up to now. Thus, we are left only with the finding that the ERDI is strongly and negatively correlated with the level of per capita GNP, with a much better "fit" at relatively high than at very low income levels, as can be seen in Figure 1.

### *3. Scaling purchasing power parities to exchange rates*

For 1975, the ICP computed the ERDI for 30 MTEs, Yugoslavia, and the three CPEs, Hungary, Poland, and Romania. However, the ICP does not yield meaningful ERDIs for the CPEs because it is difficult to interpret these countries' official exchange rates, either the commercial or the noncommercial (the ICP has used the latter). The problem, therefore, is to find a method for plausibly estimating ERDIs for CPEs in order to derive proxy exchange rates, first for 1975 (the latest year for which the ICP computed ERDIs for MTEs), and then moving the estimates to 1980.

### *(i) Estimating ERDIs for CPEs for 1975*

Various approaches have been proposed to estimate ERDIs for CPEs comparable to those calculated for MTEs. Wolf [1982] has shown that the ERDI may be decomposed into two parts:

$$\text{ERDI} = \frac{{}^{e}o}{{}^{e}p} = \frac{{}^{e}t/{}^{e}p}{{}^{e}t/{}^{e}o} \qquad [1]$$

where

${}^{e}o$ = official exchange rate
${}^{e}p$ = "overall" PPP
${}^{e}t$ = PPP for tradables

Since the data to obtain ${}^{e}t/{}^{e}p$ is generated internally by the ICP for all countries, including the three CPEs, without using an exchange rate, only the denominator, ${}^{e}t/{}^{e}o$, will have to be estimated for the CPEs, which can be done on the basis of the ${}^{e}t/{}^{e}o$'s of "comparable" MTEs.[7]

The selection of MTEs "comparable" to CPEs is, to a certain degree, judgmental, basically because there is no generally accepted explanation of what determines the ERDI. However, it was noted that the ERDI is strongly and negatively correlated with the level of per capita GNP. Recalling from [1] that the ERDI has two components, this negative correlation is the outcome of a negative correlation between ${}^{e}t/{}^{e}p$ and income level and a positive correlation between ${}^{e}t/{}^{e}o$ and income level as can be seen from the data in Table 2. Since ${}^{e}t/{}^{e}o$ is positively correlated with the level of income, the appropriate basis to estimate ${}^{e}t/{}^{e}o$ for CPEs is MTEs at approximately the same level of income. There is no circularity in this approach once we accept the PPP-based per capita GNP figures for CPEs as a point of departure, since the only issue is to estimate ${}^{e}t/{}^{e}o$, *not* the level of dollar per capita income.

TABLE 2.—PER CAPITA GDP AND EXCHANGE RATE DEVIATION INDICES FOR SELECTED MTE'S AND CPE'S IN 1975

[US = 1.00]

| Country | Per capita GDP in I $ (1) | ${}^{e}t/{}^{e}p$ (2) | ÷ | ${}^{e}t/{}^{e}o$ (3) | = | ERDI (4) |
|---|---|---|---|---|---|---|
| Group I: | | | | | | |
| Malawi | 352 | 1.44 | | .565 | | 2.55 |
| Kenya | 470 | 1.42 | | .726 | | 1.95 |
| India | 470 | 1.66 | | .514 | | 3.23 |

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[7] This insight and recommendation was made to the author by Thomas Wolf. He also made other valuable suggestions for computing ERDIs for CPEs.

TABLE 2.—PER CAPITA GDP AND EXCHANGE RATE DEVIATION INDICES FOR SELECTED MTE'S AND CPE'S IN 1975—Continued

[US=1.00]

| Country | Per capita GDP in I $ (1) | ${}^et/{}^ep$ (2) | ÷ | ${}^et/{}^eo$ (3) | = | ERDI (4) |
|---|---|---|---|---|---|---|
| Pakistan | 590 | 1.45 | | .464 | | 3.12 |
| Sri Lanka | 668 | 1.73 | | .475 | | 3.65 |
| Zambia | 738 | 1.43 | | .955 | | 1.49 |
| Thailand | 936 | [1] 1.31 | | [1] .489 | | 2.61 |
| Philippines | 946 | 1.55 | | .615 | | 2.51 |
| Group II: | | | | | | |
| Korea | 1,484 | 1.35 | | .531 | | 2.54 |
| Malaysia | 1,541 | 1.51 | | .766 | | 1.98 |
| Colombia | 1,609 | 1.47 | | .520 | | 2.83 |
| Jamaica | 1,723 | 1.37 | | 1.115 | | 1.23 |
| Syria | 1,794 | 1.14 | | .457 | | 2.50 |
| Brazil | 1,811 | 1.34 | | .849 | | 1.58 |
| Group III: | | | | | | |
| Romania | 2,387 | 1.55 | | (.797) | | (1.94) |
| Mexico | 2,487 | 1.40 | | .822 | | 1.70 |
| Yugoslavia | 2,591 | 1.29 | | .828 | | 1.56 |
| Iran | 2,705 | 1.30 | | .761 | | 1.70 |
| Uruguay | 2,844 | 1.32 | | .605 | | 2.17 |
| Ireland | 3,049 | 1.20 | | 1.049 | | 1.14 |
| Group IV: | | | | | | |
| Hungary | 3,559 | 1.41 | | (.928) | | (1.52) |
| Poland | 3,598 | 1.44 | | (.933) | | (1.54) |
| Italy | 3,861 | 1.25 | | 1.113 | | 1.12 |
| Spain | 4,010 | 1.25 | | .921 | | 1.36 |
| Group V: | | | | | | |
| United Kingdom | 4,588 | 1.18 | | 1.060 | | 1.11 |
| Japan | 4,907 | 1.04 | | .951 | | 1.10 |
| Austria | 4,995 | 1.11 | | 1.112 | | 1.00 |
| Netherlands | 5,397 | 1.06 | | 1.186 | | .89 |
| Belguim | 5,574 | 1.07 | | 1.207 | | .88 |
| France | 5,877 | 1.13 | | 1.239 | | .91 |
| Luxembourg | 5,883 | 1.10 | | 1.205 | | .91 |
| Denmark | 5,911 | 1.14 | | 1.445 | | .79 |
| Federal Republic of Germany | 5,953 | 1.10 | | 1.260 | | .88 |
| United States | 7,176 | 1.00 | | 1.000 | | 1.00 |

[1] One of these numbers must have a slight error because they yield an ERDI of 2.68.

Sources: Cols. (1) and (4): [Kravis, et. al—1982], table 1-2; col (2): Op. cit, table 6-12, col. (8) ÷ col. (10); col (3): Ibid, col. (8).

The approach used is to regress ${}^et/{}^eo$ on per capita GDPs for all or for a subgroup of MTEs (the relationship is plotted in Figure 2), then substitute the per capita GDP of each of the three CPEs into the resulting equation to obtain estimates of their ${}^et/{}^eo$. The chart and the regression coefficients show that the "fit" is not a very tight one. Using the least squares estimate yields:

$$ {}^et/{}^eo = 0.529 + 0.0001122\ Y/N $$

$$ (R^2 = 0.66;\ SEE = 0.165) \qquad [2] $$

where

Y = GDP in international dollars
N = Population
Y/N = Per capita GDP

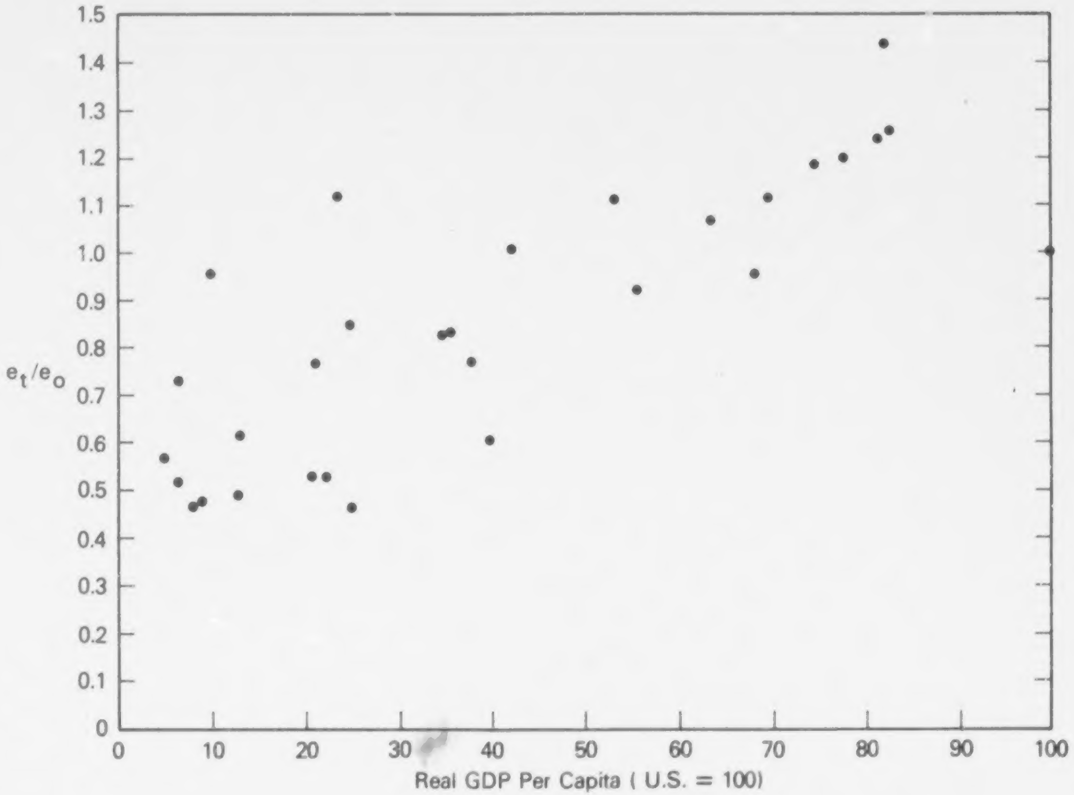
The $^et/^eo$'s of the three CPEs are obtained from [2] and are shown in parentheses in Table 2. The ERDIs are obtained by dividing col. (3) into col. (2).

It has been pointed out, however, that when one is using a regression equation such as [2] to estimate either $^et/^eo$ or the ERDI itself, the result is not a single number, but a range within a confidence interval [Hewett, 1982]. On the assumption that the scatter in Figure 2 is normally distributed, we can be 95% certain that the $^et/^eo$ is within ± 2 SEE (±0.33) of the regression line. Thus, if we want to provide a confidence band around the estimates, the ranges within which the ERDIs for the three CPEs will most probably fall are:

| Country | Estimated $^et/^eo$ | Range within ± 2 SEE | ERDI range |
|---|---|---|---|
| Romania | 0.797 | 0.467–1.127 | 1.38–3.32 |
| Hungary | .928 | .598–1.258 | 1.12–2.36 |
| Poland | .933 | .603–1.263 | 1.14–2.39 |

Figure 2.

Purchasing Power of Tradeables in Relation to Real GDP Per Capita, 1975



For CPEs not included in the ICP, the ICP results can be used to obtain per capita "international" dollar GDP estimates and ERDIs since bilateral, PPP-based comparisons with MTEs are available for the USSR (vis-a-vis the U.S.), Czechoslovakia (vis-a-vis Austria), and the GDR (vis-a-vis the FRG), as was noted. For Poland, an alternative to the ICP estimate can be obtained on the basis of its bilateral comparison with Austria. Since the partner MTEs have been included in the ICP, each CPE's 1975 per capita GDP can be estimated in "international" dollars through these bilateral links, as shown in Table 3.

The ERDIs are estimated, as before, in two steps. Based on the limited sample of three CPEs in the ICP, we obtain a relationship between CPE $^{e}t/^{e}p$ and MTE $^{e}t/^{e}p$ for a given "real" income group. In 1975, Hungarian and Polish "real" incomes were similar and so were their $^{e}t/^{e}p$ ratios: 1.41 and 1.44, respectively. Romania, with a lower "real" income, had a higher $^{e}t/^{e}p$: 1.55. The ratios of all three CPEs exceed those of their respective MTE reference groups by about 15% in each case. This suggests a systemic regularity: the relatively high level of prices of tradables to "overall" prices is explained by the fact that CPEs have relatively low prices for nontradables (e.g., services). Let us assume, therefore, that the $^{e}t/^{e}p$ of each CPE is 15% higher than that of its MTE reference group, an assumption that is not likely to introduce a significant margin of error. The other component of the ERDI, $^{e}t/^{e}o$, is estimated as before, on the basis of equation [2]:

TABLE 3.—PER CAPITA GNP AND EXCHANGE RATE DEVIATION INDICES FOR SIX CMEA COUNTRIES AND YUGOSLAVIA IN 1975

| Country | Purchasing power parity based: 1975 per capita GNP (international dollars) [1] (1) | Purchasing power parity based: As percent of U.S. per capita GNP (2) | ERDI in 1975 (3) | Adjusted PPP (proxy ER) based: 1975 per capita GNP (U.S. dollars) (4) | Adjusted PPP (proxy ER) based: As percent of U.S. per capita GNP (5) |
|---|---|---|---|---|---|
| German Democratic Republic | 4,230 | 59 | 1.32 | 3,200 | 45 |
| Czechoslovakia (bilateral with Austria and the Federal Republic of Germany) | 4,000 | 55 | 1.44 | 2,780 | 39 |
| Poland (ICP) | 3,600 | 50 | 1.54 | 2,340 | 33 |
| Poland (bilateral with Austria) | 3,000 | 42 | 1.54 | 1,950 | 27 |
| Hungary (ICP) | 3,560 | 50 | 1.52 | 2,340 | 33 |
| U.S.S.R. (bilateral with the United States) | 3,540 | 49 | 1.55 | 2,280 | 32 |
| Yugoslavia (ICP) | 2,590 | 36 | 1.56 | 1,660 | 23 |
| Romania (ICP) | 2,390 | 33 | 1.94 | 1,230 | 17 |

[1] Rounded to the nearest 10.

Sources: Per capita GNP, purchasing power parity based—German Democratic Republic: Sum of 1975 per capita consumption of DM 5,400, investment of DM 3,500 and government of DM 2,975 ([Collier], table X and section V) is DM 11,875, which is 71 percent of the per capita GNP of the Federal Republic of Germany, which equals I $4,227; Czechoslovakia: Total 1975 GNP of 474.4 billion Kcs, population of 14.918 million, and PPP of 7.95 kcs/$ yield per capita GNP of 56 percent of that of the United States, which equals I $4,000; Poland, Hungary, Yugoslavia, and Romania (ICP): [Kravis et al.—1982] table 1-2; Poland (bilateral with Austria): [Comparison], table 1 shows that on a per capita basis, Poland's 1975 GNP was 60 percent of that of Austria (geometric average of calculations in Austrian and Polish prices), which yields I $2,997; U.S.S.R: Total 1976 GNP of 400 billion rubles, population of 256.674 million, and PPP of .49 rubles/$ yields per capita GNP equal to 49.4 percent of that of the United States. Applying that percent to US 1975 GNP yields I $3,545. Per capita GNP, adjusted PPP based: column (1) divided by column (3), except Yugoslavia: official figures published in the Atlas. ERDI: Derivation explained in the text, except Yugoslavia: calculated by the ICP.

| CPE | Reference MTEs | $^{e}t/^{e}p$ |  | $^{e}t/^{e}o$ | ERDI of CPE |
|---|---|---|---|---|---|
|  |  | MTE | CPE |  |  |
| German Democratic Republic | Austria, Japan, United Kingdom, Italy, Spain | 1.16 | 1.33 | 1.004 | 1.32 (1.00–1.97) |
| Czechoslovakia | United Kingdom, Italy, Spain | 1.23 | 1.41 | .978 | 1.44 (1.08–2.18) |
| U.S.S.R | Italy, Spain | 1.25 | 1.44 | .926 | 1.55 (1.15–2.42) |

## *(ii) Estimating ERDIs for CPEs for 1980*

PPP-based per capita dollar GDP figures are available for 1980 for six CPEs. What ERDIs should be applied to adjust these figures? One option would be to employ the ERDIs computed for 1975, without adjustment. That, however, would mean an asymmetrical treatment of CPEs and MTEs, since between 1975 and 1980 the ERDIs of MTEs did not remain unchanged. The 1980 ERDIs of MTEs can be estimated by juxtaposing changes in exchange rates and inflation differentials between each country and the U.S. For example, if between 1975 and 1980 an MTEs price level increased faster than the U.S. price level but its exchange rate depreciated (increased) by less than the price differential, then its ERDI declined. More generally:

$$\mathrm{ERDI}_{80} = \cfrac{(\mathrm{ERDI}_{75})\quad ({}^{e}o_{80}/{}^{e}o_{75})}{\cfrac{{}^{P}\mathrm{MTE}_{80}/{}^{P}\mathrm{MTE}_{75}}{{}^{P}\mathrm{US}_{80}/{}^{P}\mathrm{US}_{75}}} \qquad [3]$$

where

$^{e}o$ = official exchange rate against the dollar

P = price index (GNP deflator if available, otherwise the consumer price index)

A comparison of the 1980 and 1975 ERDIs of 30 MTEs included in Phase III of the ICP yields remarkably consistent results: the ERDIs of 25 of the 30 countries had declined, the average ERDI of each of the five groups of countries classified by ascending income level (see Table 2) also declined, and so did every one of the 16 MTE's comprising the three highest per capita income groups, with which the CPEs can be most readily compared. The percent change in the ERDIs of the individual countries in the five income groups (countries listed in the same order as in Table 2) were:

| Group I | Group II | Group III | Group IV | Group V |
|---|---|---|---|---|
| −15 | −20 | −12 | −13 | −32 |
| −20 | +2 | −12 | −24 | −21 |
| +9 | −26 | −36 |  | −18 |
| −8 | +2 | −40 |  | −17 |
| Omit [1] | −8 | −21 |  | −17 |
| −13 | +16 |  |  | −14 |
| −11 |  |  |  | −15 |
| −16 |  |  |  | −16 |
|  |  |  |  | −15 |
| Group average: | −11 | −6 | −24 | −18 |

[1] Sri Lanka, which in 1975 already had the highest ERDI of 3.65, by 1980 more than doubled it to 7.53, a figure so implausible that the country was omitted from the computations.

There does not seem to be any correlation between the steepness of the decline in the ERDI and the level of per capita income: the average decline for Groups III, IV and V was about 20%, those of Groups I and II somewhat lower.

Whether we take the average change in the ERDIs of each group or the average of all of the countries individually, between 1975 and 1980 the average decline in the ERDIs was about 15%. This can be interpreted as the (unweighted) average decline in the effective exchange rate of the U.S. dollar against a representative basket of the world's convertible currencies. Therefore, to preserve the comparability of the per capita income levels of CPEs and MTEs expressed in current U.S. dollars, the 1980 ERDIs of the CPEs must be reduced by 15% also, yielding (the range within ±2 SEE in parentheses):

| | | |
|---|---|---|
| German Democratic Republic | 1.12 | (0.85–1.67) |
| Czechoslovakia | 1.22 | (0.92–1.85) |
| Hungary | 1.29 | (0.95–2.00) |
| Poland | 1.31 | (0.97–2.03) |
| U.S.S.R. | 1.32 | (0.98–2.06) |
| Romania | 1.65 | (1.17–2.82) |

The resulting dollar per capita GNP estimates are shown in Table 4, page 167.

### *4. The Physical Indicators Method*

The fourth approach to estimating per capita dollar GNP for MTEs or CPEs is the physical indicator method. Its most distinctive feature when applied to CPEs is that it does not have to use any kind of currency conversion.

#### *i. General Methodology*

The essence of this simplified or "short-cut" approach is obtaining a regression relationship between a set of physical indicators of development and per capita dollar GDP for MTEs. The statistical relationship obtained is then used to estimate the per capita dollar GDP both of the countries included in the sample and of CPEs for which neither GDP nor meaningful dollar exchange rate could be found. The independent pioneers of this method were Hungarian economist [Janossy] and English economist [Beckerman]. Janossy's associate, Eva Ehrlich has continued to develop the original method in Hungary and apply it to an increasing number of MTEs and CPEs. A version of the Janossy-Ehrlich method was adopted by the Economic Commission for Europe (ECE) of the United Nations. The most recent ECE calculations, published in 1980, include 30 MTEs and 7 European CPEs for the benchmark years 1950, 1955, 1965, 1970, and 1973, relying on 30 physical indicators to make the estimates [Comparative]. The 1973 per capita income estimates are shown in Table 4.

The basic assumption of the Janossy-Ehrlich-ECE version of the method is that a country's level of economic development is revealed in many areas of its consumption and by its stock of accumulated assets. Although no single physical indicator by itself is capable of indicating accurately the level of development of a country, this can be accomplished by relying on a judiciously selected set of physical indicators, each providing an independent estimate of per capita GNP, to be averaged.

The basic method of estimating per capita dollar GNP according to the Janossy-Ehrlich-ECE approach involves the following steps:

(1) Select a group of MTEs and convert their official per capita GDP in NCUs to dollars, using the prevailing exchange rates;

(2) Select those physical indicators which show a high correlation with the above per capita dollar GDP figures;

(3) Determine individual regression lines between each physical indicator and the per capita dollar GDP of the sample countries. (The number and type of physical indicators as well as the method of determining the regression lines are different in the Janossy-Ehrlich and in the ECE versions; for the latter reason especially their results are not directly comparable.)[8]

(4) On the basis of the regression lines obtained in step (3), determine the predicted relationship between each physical indicator actually observed (official data mostly on intermediate and final consumption) and the estimated per capita dollar GDP.

(5) There will be as many GDP estimates for each country as there are physical indicators with actual observations. The geometric average of all the GDP estimates for a given country will be the "adjusted" per capita dollar GDP estimate for that country.

(6) Next comes a series of iterations whose purpose is to obtain a tighter fit between each indicator and the successively "adjusted" per capita dollar GDP estimates. The iteration consists of repeating steps (3) through (5) while substituting the latest "adjusted" per capita dollar GDP estimate for the original dollar GDP estimate. The iteration ends when the nth "adjusted" dollar per capita GDP estimate coincides with the n-1 estimate. This last value is taken to be the "corrected" GDP estimate for each country. The final per capita dollar GDP estimate so obtained for the U.S. and the other countries is in effect valued not at domestic U.S. dollars but in a currency unit which reflects the dollar's realistic international purchasing power for goods and services traded internationally. The

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[8] The ECE selects one of ten mathematically specified regression relationships on the basis of the best "fit", whereas the Janossy-Ehrlich-Partos approach determines the shape of the regression line on the basis of visual inspection, then specifies its mathematical function. Although the latter approach has been criticized as being somewhat subjective, its authors claim that it is better able to reflect economic reality, which may be quite dissimilar for countries at different income levels. The dissimilarity of the functional relationship at widely different income levels often cannot be captured accurately by one of the standard regression formulas. In any event, subjectivity is constrained by the application of the iterative procedure described in step (6).

difference between the original and the "corrected" U.S. per capita GDP estimate in any given year is due largely to the temporary over- or under-valuation of the U.S. dollar in terms of other currencies. The "international purchasing power dollar" obtained via this method is to be distinguished from the ICP's "international dollar" which has the same purchasing power over U.S. GDP as a whole as the U.S. dollar and has a PPP-based scale vis-a-vis other currencies.[9]

(7) The last step is to estimate the per capita dollar GDPs of CPEs by substituting the physical indicators of these countries into the regression equations obtained for the reference group of MTEs.

The main utility of the physical indicators method is its ability to derive per capita dollar GDP estimates for countries without official or reliable per capita GDP (or GNP, NMP, etc.) values in NCUs or meaningful dollar exchange rate. A further advantage of the method is the information it generates about differences in the production or consumption structures of countries, some of which are economic system determined. Finally, this method can also yield internationally comparable growth rates.[10]

### *ii. Alleged problems*

The physical indicator method is alleged to have some shortcomings, especially when applied to CPEs.

*a. What is being measured?*—Many of the physical indicators used cover aspects which are not, or are only partially included in GDP estimates, such as welfare-type measures (e.g., infant mortality), stock measures (e.g., rooms per thousand inhabitants), and employment statistics (e.g., manfacturing and agricultural employments, respectively, as percents of total employment). Thus, the estimates obtained represent economic attainments which go beyond the conventional GDP measure. The proponents of the method point out that infant mortality is a proxy for annual health expenditures, the stock of housing for the annual housing rent, and so on. Moreover, each indicator has been found to have a high correlation with the level of GDP—across countries and over time—and therefore can be used for estimating GDPs, especially of countries for which alternative approaches yield inferior results.

*b. Weighting.*—Since each estimate provided by each indicator is given equal weight (they are averaged to yield a composite per capita GDP estimate), some GDP activities are under-, others are over-represented, thus introducing bias. This criticism is answered that, at the practical level, experiments with elaborate weighting systems do not yield obviously superior results and that with a large number of indicators, slight changes in the weighting system stop being important.

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[9] It is very important to note, by contrast, that although the physical indicator method corrects the original GDP values for the under- or over-valuation of the dollar vis-a-vis other convertible currencies, it still preserves the prevailing exchange rate scale in the regression lines. For this reason, to be able to compare meaningfully the results obtained by the physical indicator method with those of the ICP, a scale transformation (similar to moving from a Celsius to a Fahrenheit measuring rod) must be affected via procedure explained in [Ehrlich and Partos]. The scale transformation is simply a method of estimating the ERDI.

[10] The usual growth rate computations by the CSOs of the individual countries are able more or less to eliminate changes in relative prices within a given country but are unable to handle satisfactorily differences in relative prices among the countries. This is why growth rates are not readily comparable across countries. The computation of growth rates via the physical indicator method, however, is not a simple task because it must adjust for changes over time (1) in the value of the dollar in which the original GDPs are expressed; (2) in the relationship between the dollar and other national currencies; and (3) in the relationship between the per capita dollar GDP and the different physical indicators.

*c. Disregarding quality differences.*—No account is taken of large differences among countries in the quality of products used as a physical indicator, such as passenger cars, television sets, meat consumed, and so on. This introduces an upward bias into the GDP estimates of the lower-income countries as compared with those of higher-income nations because lower levels of development are associated with poorer-quality products. It would appear that this is an especially serious problem for CPEs, whose economies are known to be producing, on the average, lower-quality products than do market economies at comparable levels of development.

*d. Inefficient production will cause bias.*—Some of the physical indicators represent final consumption, others intermediate consumption. Inefficient use of materials—especially characteristic of CPEs—will be reflected in relatively high GDP estimates based on such indicators. That is, that logic of the method is that the wasteful use of material inputs will yield GDP estimates that are upward biased.

### *iii. Overall assessment*

The alleged shortcoming mentioned first and second do not introduce any known bias. The third and fourth problems will cause an upward bias in the estimates for CPEs, especially vis-a-vis high-income MTEs, but should not effect intra-CMEA comparisons in a major way since quality and production inefficiency are problems in all CPEs. To be sure, these may be greater problems in the relatively less developed countries, whose estimates, therefore, could be biased upward relative to those of the other CMEA countries.

An examination of the physical indicator method's logic, relatively simple data requirements, and comparative ease of computation (say, once every few years to obtain benchmark estimates) suggest that its use should once again be seriously considered. Unfortunately, the ECE which up to 1980 had devoted considerable resources to develop the methodology and to carry out and publish the computations for several benchmark years up to 1973, recently stopped all work on this method, apparently at least partly for political reasons. During 1973-76, the World Bank had employed the physical indicator approach to estimate the per capita GNPs of CPEs, in the *Atlas,* but then discarded the method also. Given the limited time and resources to complete this project, it was not possible to undertake new benchmark year computations to extend the results to 1980. However, considering that it will not be possible to find a "best"method that is free from substantial controversies, the physical indicator approach has much to recommend it.

## *B. Comparison of alternative dollar per capita GNP estimates*

### *1. Comparability of alternative estimates*

Table 4 juxtaposes the per capita dollar GNP estimates obtained through the application of four alternative methods, for the latest year available. To facilitate comparisons, Yugoslavia is also included and the resulting per capita dollar GNP of each country is expressed as percent of the U.S. level.

The first two columns present the 1980 dollar per capita GNPs that result from using one of the official rates, the commercial exchange rate (or FTM) in col. (1) and the tourist (i.e., the noncommercial) rate in col. (2). Since 1977, the World Bank has been employing one or the other of these two exchange rates to report the GNP or CPEs in the Atlas [Marer 1985, Appendix A]. The next two columns show estimates of 1975 and 1980 income levels using PPPs as convertors; columns (5) and (6) report the 1975 and 1980 income levels if the PPP convertors are "scaled" to proxy exchange rates by the application of the ERDIs computed earlier. The last column presents the 1973 income levels resulting from the physical indicators method.

## TABLE 4. ALTERNATIVE ESTIMATES OF PER CAPITA DOLLAR GNP OF THE EUROPEAN CMEA COUNTRIES AND YUGOSLAVIA IN 1973, 1975, AND 1980

[In dollars and as percent of the U.S. level]

| Country | Prevailing exchange rates, 1980 | | | | Purchasing power parity | | | | PPP scaled to "proxy" ER | | | | Physical indicators ECE-1973 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Comm. or FTM | | Tourist | | 1975 | | 1980 | | 1975 | | 1980 | | | |
| | Dollars | US = 1.00 | Dollars | US = 1.00 | International dollars | US = 1.00 | International dollars | US = 1.00 | iPP$ | US = 1.00 | IPP$ | US = 1.00 | IPP$ | US = 1.00 |
| | (1) | | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | |
| German Democratic Republic | 3,940 | .35 | 7,140 | .63 | 4,320 | .59 | 6,630 | .58 | 3,200 | .45 | 5,910 | .52 | 3,240 | .60 |
| Czechoslovakia | 1,920 | .17 | 3,930 | .35 | 4,000 | .56 | 5,790 | .51 | 2,780 | .39 | 4,740 | .42 | 3,080 | .57 |
| U.S.S.R. | [1] 3,420 | .30 | 3,420 | .30 | 3,540 | .50 | 5,550 | .49 | 2,280 | .32 | 4,190 | .37 | 2,620 | .48 |
| Hungary | 2,060 | .18 | 3,020 | .27 | 3,560 | .50 | 5,660 | .50 | 2,340 | .33 | 4,390 | .39 | 2,380 | .44 |
| Poland | 1,553 | .14 | 2,290 | .20 | 3,600 | .50 | 4,890 | .43 | 2,340 | .33 | 3,730 | .33 | 2,410 | .45 |
| Bulgaria | [1] 3,551 | .31 | 2,340 | .21 | NA | ........ | NA | ........ | NA | ........ | NA | ........ | 2,351 | .43 |
| Romania | 1,550 | .14 | 2,320 | .20 | 2,390 | .33 | 4,420 | .39 | 1,230 | .17 | 2,680 | .24 | 1,970 | .36 |
| Yugoslavia | 2,620 | .23 | 2,620 | .23 | 2,591 | .36 | 3,620 | .32 | 1,660 | .23 | 2,620 | .23 | 1,760 | .32 |

[1] At the official exchange rate.

Source: Cols. (1) and (2): Per capita GNP in NCUs shown in Table 1 divided by the exchange rates shown in Appendix Tables 1-9; Col. (3): [Kravis et al. 1982]; Col. (4): GNP per capita in NCUs divided by 1980 PPP estimates, derivation shown in Appendix Tables 1-9; Cols. (5) and (6): Cols. (3) and (4) respectively, adjusted by ERDIs whose derivation is explained in the text; Col. (7): [Comparative].

For a given country, neither the absolute numbers nor the relatives can be compared directly across the columns because of differences in the years, so that both a country's real income and the current value of the dollar will have changed, and because of differences in the measuring scales employed. Each column in Table 4 has been constructed using one of three scales: the "exchange rate scale" in columns (1) and (2), the "purchasing power parity scale" in columns (3) and 4), and the "international purchasing power dollar scale" (meaning that the prevailing exchange rates have been adjusted for the under- or over-valuation of the U.S. dollar against a basket of convertible currencies) in columns (5), (6), and (7).

Because even large discrepancies in the growth rates between two countries over a period of a few years will not cause large changes in their relative income levels, it is possible to compare the per capita dollar GNP relatives for different (but nearby) years if both estimates use the same measuring scale. On the other hand one has to be much more cautious in comparing alternative estimates, even for the same year, if different scales are involved.

### *2. Criteria for evaluating alternative estimates*

There is no scientific test to evaluate the per capita dollar GNPs resulting from the application of alternative conversion coefficients or approaches. The only test that can be applied is that of plausibility. One approach is to compare the per capita dollar GNPs with the results of independent studies, themselves judged plausible by experts. For example, one may assess the per capita dollar GNPs in terms of the ordinal and cardinal ranking of the countries within the CMEA against the results of similar computations carried out by CMEA experts. The results of alternative estimates using identical measuring scales can be juxtaposed. Alternatively, the estimates may be assessed against carefully performed bilateral or multilateral comparisons of an earlier period, when data may have been more readily available, moved forward to a current benchmark year by "reasonable" growth rates. One may juxtapose certain pairs of CPE and MTE countries, such as East vs West Germany, Hungary vs Austria, and Romania vs Yugoslavia, to ascertain whether the bilateral relatives are within some "reasonable" range.

Still another approach is to examine the plausibility of the implications of the per capita dollar GNPs, for example, in terms of the implied foreign trade participation ratios (TPRs) (dollar exports plus imports divided by dollar GNP). Since the numerator of the TPR can be obtained without having to select a convertor, the value of a country's TPR will vary depending on which dollar GNP estimate is used in the denominator.

In brief, per capita dollar GNPs that will be found to be more plausible according to several of the criteria mentioned should be considered "better" than alternative estimates that are less believable.

### *(i) Expert studies in the CMEA*

The plausibility of the alternative sets of estimates can be assessed first and foremost against studies by experts in the CMEA of the ranking of the per capita incomes of the CMEA countries.

For more than two decades, the CSOs of the CMEA countries have been carrying out ICP-type computations, comparing the national income levels and structures of the member countries and, more recently, Yugoslavia, under the auspices of the CMEA Statistical Commission.[11] Up to now, the work on comparisons involved four phases: in Phase I, comparisons were made with 1959 as the base year (using average 1958–61 values); Phase II for 1966 (1960–63 average), Phase III for 1973 (1970–73), and Phase IV for 1978 (1974–78) [Szilagyi, 1979]. During the initial phases of the project, the participants were unaware of the OECD-sponsored Gilbert-Kravis study (predecessor of the ICP) and independently designed an approach similar to the ICP method; in subsequent stages, the project benefited from the literature and practice of the ICP and other international comparison projects [Szilagyi, 1979]. Unfortunately, the empirical findings of the CMEA studies have not been published, presumably because of the politically sensitive nature of income level comparisons. However, a leading Hungarian expert, who has been participating in the work ot the CMEA project, has published an article reporting the methodology and the results of his own independent, physical-indicators-type calculations on comparing the national incomes of six CMEA countries and Yugoslavia in 1973 [Szilagyi, 1978].[12] Unfortunately, the published verison omits the USSR, presumably because its level of income vis-a-vis those of the individual East European countries is a particularly sensitive matter. Although the comparisons are for 1973, refer only to material production, and the author lists numerous caveats about the accuracy of his results (noting especially that the greater the difference between the structures of two economies, the greater the margin of error in the estimates of their development levels), it would seem reasonable to assume that his results would not be very different from those of the CMEA study, and can thus be taken as a proxy for the CMEA experts' computations. National income levels in 1973, expressed as percent of the Hungarian level, were: [13]

| | |
|---|---|
| German Democratic Republic | 124 |
| Czechoslovakia | 122 |
| Hungary | 100 |
| Poland | 100 |
| Bulgaria | 95 |
| Romania | 81 |
| Yugoslavia | 72 |

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[11] The project is formally called "International Comparison of the Main Indices of the Levels of Development of the CMEA Countries and Yugoslavia."

[12] Reports of an earlier CMEA comparison, including the U.S.S.R., have also been published in the Soviet Union by Ribokov in *Voprosi Ekonomiki* (January 1967).

[13] Estimates of absolute levels are given only in forints [Szilagyi, 1978, p. 155].

### (ii) Foreign trade participation ratios

Another criterion is implied TPRs, since East-West trade is priced and settled in covertible currencies and intra-CPE trade is evaluated at average world market prices of the last few years, which can be reconverted from "devisa-NCUs" to dollars by each country's official exchange rates. Thus, one may obtain the approximate dollar value of a CMEA country's exports and imports independently of the GNP estimate or convertor.[14] Each dollar GNP estimate thus yields a different TPR. Numerous studies have shown that such ratios are lower in CPEs than in MTEs of approximately the same size (population) and level of development [Hewett, 1980]. The reasons for this are largely systemic:

Most foreign trade decisions are made by central planners; arbitrary domestic prices make it difficult for them to discern profitable trading opportunities.

The central planner's desire for control promotes self sufficiency whenever domestic production is a feasible alternative to imports.

Within the CEMA, it has not proved possible to find an effective mechanism for promoting intra-industry specialization, which accounts for much trade among MTEs.

Producing enterprises have little direct contact with customers and suppliers in other countries. Since producing for the foreign market is more difficult than supplying the domestic market, which typically has excess demand for most goods, the majority of firms are fundamentally disinterested in exports. In most cases the firm's existence is not threatened by its inability to export.

To be sure, there are some offsetting pressures which push up a CPE's trade participation ratios: the desire of central planners to overcome bottlenecks and to speed up growth encourage imports. An excess of imports over exports can be supported temporarily by large loans, which had been available and taken up by all CPEs until recently. Nevertheless, the consensus of experts is that the TPRs of CPEs are certainly not higher, and most probably significantly lower, than those of MTEs of approximately the same size and development level.

### 3. Plausibility of alternative estimates

Let us try to assess the plausibility of the alternative sets of estimates against four criteria: the relative ranking of incomes in the CMEA; the implied TPRs of CPEs and the actual TPRs of MTEs of approximately the same size and level of development; bilateral comparisons between selected CPEs and MTEs; and a juxtaposition of estimates that can be directly compared.

Table 5 shows the relative ranking of the CMEA countries, taking Hungary as 1.00 and the rankings provided by the CMEA study cited earlier as our reference point. Although the different measurement scales employed by the estimates means that neither the absolute dollar values nor the countries' ranking vis-a-vis the U.S. can be meaningfully compared, the different scales should not affect the relative ranking of the countries within the CMEA.

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[14] To be sure, the dollar values of foreign trade are only approximate because prices in intra-CMEA trade may be significantly higher or lower than those on the world market or in East-West transactions.

TABLE 5.—RANKING OF THE PER CAPITA INCOME LEVELS OF THE EUROPEAN CMEA COUNTRIES AND YUGOSLAVIA ACCORDING TO ALTERNATIVE ESTIMATES FOR 1973, 1975, AND 1980

[Hungary = 1.00]

| Country | CMEA-Study 1973 | Commer. ER 1980 | Tourist ER 1980 | Purchasing power | | PPP scaled to ER | | Physical ind-ECE, 1973 |
|---|---|---|---|---|---|---|---|---|
| | | | | 1975 | 1980 | 1975 | 1980 | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| German Democratic Republic | 1.24 | 1.91 | 2.36 | 1.19 | 1.17 | 1.37 | 1.35 | 1.36 |
| Czechoslovakia | 1.22 | .93 | 1.30 | 1.12 | 1.02 | 1.19 | 1.08 | 1.29 |
| U.S.S.R. | NA | 1.66 | 1.13 | 1.00 | .98 | .97 | .95 | 1.10 |
| Hungary | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Poland | 1.00 | .75 | .76 | 1.01 | .86 | 1.00 | .85 | 1.01 |
| Bulgaria | .95 | 1.72 | .77 | NA | NA | NA | NA | .99 |
| Romania | .81 | .75 | .77 | .67 | [1] .78 | .53 | .61 | .83 |
| Yugoslavia | .72 | 1.30 | .87 | .73 | .64 | .71 | .60 | .74 |

[1] The large jump from 1975 to 1980 is largely explained by the downward bias in Romania's official price index [Jackson].

Source: Col (1): [Szilagyi, 1978], p. 155; Cols. (2)-(8): Table 4.

### *(i) Relative income levels in the CMEA*

The pattern revealed by the reference CMEA study in column (1) of Table 5 is generally in accord with how experts in the East and West have been ranking the development levels of the CMEA countries. The top group is comprised of the GDR and Czechoslovakia, with the GDR's income being somewhat higher. The middle group is made up of Hungary, Poland, presumably the USSR, and Bulgaria; the third group, Romania and Yugoslavia. The only "surprise" is the ranking of Bulgaria at the low end of the middle group instead at the top of the third group. Since the CMEA (as well the ECE) estimates are both based on the physical indicators approach (though their implementation is quite different), the reason for the relatively high income level of Bulgaria, and to some extent also Romania, is pinpointed by the Hungarian pioneers of the method [Ehrlich and Partos]:

> In the case of Bulgaria, exceedingly high estimates are obtained on the basis of indicators characteristic of the consumption of materials by producing units (lead, synthetic fertilizer, energy, kilowatt-hours used, tonnage of products). The unusually high cement indicator suggests large-scale investment and construction activity. We find it difficult to explain (even considering the climatic conditions of the country) that the natural-fiber textile indicator suggests a level of per capita GDP exceeding even that of the US. . . . However, other indicators connected with the standard of living suggest relative backwardness: grain consumption is relatively high whereas milk consumption is relatively low. Among the stock-type indicators, relatively low are the proportion of flats with toilets, plumbing, and other living space indicators, and the number of radios. . . .
>
> Romania is also characterized by the high consumption of materials by producing units and the relatively low level of indicators linked to the standard of living and to infrastructure.

Most consistent with the CMEA study is the ECE physical-indicators-based results (col. 8). The concordence is significant because in the CMEA study the estimating equations were based entirely on information obtained from the CMEA countries, whereas in the ECE study the estimating equations were derived from the data of MTEs only. The rankings based on PPP convertors and on adjusted

PPP conversion are consistent in 1975 as well as in 1980 with the results of the CMEA study. To be sure, in these estimates it is not always clear whether Romania or Yugoslavia has a higher level of income; but the reference as well as the ECE studies are likely to have a built in upward bias for Romania, for the reasons mentioned.

Using the prevailing commercial exchange rates of the CPEs yields unrealistic per capita income relatives for the group as a whole. The GDR is shown to be at more than twice the income level of Czechoslovakia; the USSR's income is 71% higher than that of Czechoslovakia, while Bulgaria is revealed to be the second most developed country in the bloc, with more than twice the level of income of Poland or Romania. By contrast, Czechoslovakia, Hungary, and Poland have income levels that are much too low relative to those of the other CMEA countries. The results confirm the preliminary conclusion reached earlier, that the commercial exchange rates of CPEs cannot be applied as a uniform set of convertors to yield realistic dollar per capita incomes.

The official tourist exchange rates appear to yield more acceptable intra-CMEA relatives if the GDR is omitted. However, before too great a significance is attached to this, it should be noted that if the relatives would be computed according to exchange rates in effect at the beginning of 1982, they would show (Hungary=1.00).

| | |
|---|---|
| German Democratic Republic | 3.00 |
| Czechoslovakia | 1.85 |
| USSR | 1.61 |
| Hungary | 1.00 |
| Poland | .46 |
| Bulgaria | 1.18 |
| Romania | 1.32 |

The inordinately large change in the relatives is caused mainly by Hungary's substantial and Poland's drastic devaluation of their recently unified exchange rates.

### *(ii) Foreign trade participation ratios*

Table 6 presents the population, the alternative per capita GNPs, and the implied TPRs of seven CPEs and 24 MTEs. Within each group, the countries are listed in order of increasing size of population. TPRs have been shown to be lower for CPEs than for MTEs of approximately the same size and level of development, for the systemic reasons enumerated earlier.

The dollar value of a CPEs total exports and imports, which is independent of the exchange rates used, can be determined more readily than its GNP. Since the numerator of the TPR is held constant, the ratio will change if the estimated dollar value of GNP changes. A derived TPR cannot prove that this or that converter is accurate, but it may call into question the plausibility of a convertor if the resulting dollar per capita GNP yields a TPR significantly higher for a CPE than those of comparable MTEs.[15]

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[15] TPRs implied by the physical indicators method are not shown because 1973 is the latest year for the CPEs. Those based on PPP convertors are not shown because the CPE/MTE ratios would be approximately the same as those shown for the adjusted PPP convertors for CPEs and the prevailing exchange rates for MTEs.

The TPRs of individual CPEs and MTEs are juxtaposed below, the latter selected on the basis of comparability based on size of country, per capita GNP and geographic location.

TABLE 6—FOREIGN TRADE PARTICIPATION RATIOS OF SELECTED CPES AND MTES, 1980

| Country | Population (Millions) (1) | Convertor (2) | Per capita GNP (Current dollars) (3) | Implied TPR [1] (4) |
|---|---|---|---|---|
| CPEs: | | | | |
| Bulgaria | 9.0 | Official ER | 3,551 | .63 |
| | | Tourist ER | 2,340 | .95 |
| Hungary | 10.8 | Adjusted PPP | 4,390 | .38 |
| | | Commercial ER | 2,060 | .81 |
| | | Tourist ER | 3,020 | .55 |
| Czechoslovakia | 15.3 | Adjusted PPP | 4,740 | .41 |
| | | FTM | 1,920 | 1.02 |
| | | Tourist ER | 3,930 | .50 |
| GDR | 16.9 | Adjusted PPP | 5,910 | .36 |
| | | Commercial ER [2] | 3,940 | .55 |
| | | Tourist | 7,140 | .30 |
| Romania | 22.2 | Adjusted PPP | 2,680 | .43 |
| | | Commercial ER | 1,550 | .74 |
| | | Tourist ER | 2,320 | .49 |
| Poland | 35.8 | Adjusted PPP | 3,730 | .27 |
| | | Commercial ER | 1,553 | .65 |
| | | Tourist ER | 2,290 | .44 |
| U.S.S.R | 265.5 | Adjusted PPP | 4,190 | .13 |
| | | Official ER [3] | 3,420 | .18 |
| MTEs: | | | | |
| Ireland | 3.3 | Prevailing ER | 4,880 | 1.22 |
| Israel | 3.9 | do | 4,500 | .75 |
| Norway | 4.1 | do | 12,650 | .68 |
| Finland | 4.9 | do | 9,720 | .62 |
| Denmark | 5.1 | do | 12,950 | .54 |
| Switzerland | 6.5 | do | 16,440 | .62 |
| Austria | 7.5 | do | 10,230 | .55 |
| Sweden | 8.3 | do | 13,520 | .57 |
| Greece | 9.6 | do | 4,380 | .37 |
| Portugal | 9.8 | do | 2,370 | .60 |
| Belgium | 9.8 | do | 12,180 | 1.13 |
| Chile | 11.1 | do | 2,150 | .44 |
| Iraq | 13.1 | do | 3,020 | .93 |
| Netherlands | 14.1 | do | 11,470 | .93 |
| Venezuela | 14.9 | do | 3,630 | .57 |
| Yugoslavia | 22.3 | do | 2,620 | .38 |
| Argentina | 27.7 | do | 2,390 | .28 |
| Spain | 37.4 | do | 5,400 | .27 |
| France | 53.5 | do | 11,730 | .39 |
| United Kingdom | 55.9 | do | 7,920 | .53 |
| Italy | 56.9 | do | 6,480 | .48 |
| FRG | 60.9 | do | 13,590 | .41 |
| Mexico | 69.8 | do | 2,090 | .24 |
| Brazil | 118.7 | do | 2,050 | .19 |
| United States | 227.7 | do | 11,360 | .18 |

[1] Exports and Imports/GNP.
[2] Pro forma commercial exchange rate.
[3] Same as the tourist exchange rate.

Sources: Col. (1): [World], table 1; cols. (2) and (3), CPEs: table 4; MTEs: [World], table 1; col. (4): Dollar value of exports and imports taken from [World], table 8, divided by total GNP obtained by multiplying cols. (1) and (3).

German Democratic Republic:

| | | | |
|---|---|---|---|
| GNP at the pro forma comm. rate | .55 | Austria | .55 |
| GNP at adjusted PPP | .36 | United Kingdom | .53 |
| GNP at tourist exchange rate | .30 | Italy | .48 |
| | | Federal Republic of Germany | .41 |

The TPR implied by the adjusted PPP is slightly lower than that of the FRG. Because the GDR is only one third as large as the FRG, a higher TPR would be expected. However, because the GDR is at a lower income level and is a CPE, a lower TPR would be more likely. None of the three convertors thus yields clearly implausible TPRs.

Czechoslovakia:

| | | | |
|---|---|---|---|
| GNP at the FTM (estimated) | 1.02 | Netherlands | .93 |
| GNP at tourist exchange rate | .50 | Austria | .55 |
| GNP at adjusted PPP | .41 | United Kingdom | .53 |
| | | Italy | .48 |
| | | France | .39 |

The juxtaposition suggests that the estimated FTM does not yield a plausible per capita dollar GNP estimate.

USSR:

| | | | |
|---|---|---|---|
| GNP at official exchange rate | .13 | Italy | .48 |
| GNP at adjusted PPP | .16 | Spain | .37 |
| | | Brazil | .19 |
| | | United States | .18 |

Although in comparison with the USA, the USSR's TPRs seem rather high, neither one of the two estimates can be labeled as clearly unrealistic.

Hungary:

| | | | |
|---|---|---|---|
| GNP at commercial exchange rate | .81 | Austria | .55 |
| GNP at tourist exchange rate | .55 | Italy | .48 |
| GNP at adjusted PPP | .38 | Greece | .37 |
| | | Spain | .27 |

The per capita dollar GNP that obtains at the commercial exchange rate seems implausibly low because it would imply that Hungary participates in international trade three times more actively than Spain and much more intensively than Austria, Denmark, Switzerland and all other West European countries except Belgium, the Netherlands, and Ireland.

Poland:

| | | | |
|---|---|---|---|
| GNP at commercial exchange rate | .65 | Sweden | .57 |
| GNP at tourist exchange rate | .44 | Italy | .48 |
| GNP at adjusted PPP | .27 | Yugoslavia | .38 |
| | | Argentina | .28 |
| | | Spain | .27 |

A comparison of TPRs suggests that the use of the commercial exchange rate yields implausibly low per capita GNP estimates.

| | | | |
|---|---|---|---|
| Bulgaria: | | | |
| GNP at tourist exchange rate | .95 | Portugal | .60 |
| GNP at official exchange rate | .63 | Yugoslavia | .38 |
| | | Greece | .37 |

The per capita dollar GNP that results if the tourist exchange rate is used seems implausibly low because it would imply that Bulgaria participates in foreign trade almost three times more intensively than Greece or Yugoslavia and more actively than all but two MTEs, Belgium and Ireland.

| | | | |
|---|---|---|---|
| Romania: | | | |
| GNP at commercial exchange rate | .74 | Portugal | .60 |
| GNP at adjusted PPP | .43 | Venezuela | .57 |
| GNP at tourist exchange rate | .49 | Yugoslavia | .38 |
| | | Greece | .37 |
| | | Argentina | .28 |

Since the dollar GNP obtained via the commercial exchange rate yields a TPR twice as high as that of Yugoslavia and Greece and higher than those of most of even the smaller West European countries, that option does not appear to be a plausible one.

The basic conclusion suggested by a comparison of CPE and MTE TPRs is that for the three CPEs for which their commercial exchange rates might possibly be used—Hungary, Poland and Romania—the resulting per capita dollar GNPs would appear to be exceedingly—almost certainly implausibly—low. The TPRs that result if the adjusted PPP were to be used as convertors appear in all cases to fall within plausible ranges.

### *(iii) CPE and MTE income levels compared*

In this section we will juxtapose alternative calculations of per capita dollar GNPs of the CPEs and selected MTEs. To facilitate cross-country comparisons, the dollar figures are expressed as relatives of the U.S. Meaningful direct comparisons between CPEs and MTEs can be made only for the same year and if comparable estimating methods were used. Which CPE is to be compared with which particular MTE in order to ascertain the plausibility of their per capita income relationships is to some degree a matter of judgment, as is the conclusions one draws from the comparisons. Because of our previous discussion and the tests performed so far suggest that the physical indicators method yields plausible outcomes and because it derives per capita income level estimates using the same method for CPEs and MTEs without employing a monetary convertor for CPEs, its results will be used as a point of reference for evaluating the estimates obtained by other methods. To be sure, the CPE/MTE ratios will have an upward bias, for the reasons discussed earlier.

*ECE-1973.*—The most relevant comparisons for the highest-, medium-, and least-developed CPEs would appear to be the following MTEs (the numbers represent each country's per capita GNP relative to that of the U.S.):

| | | | |
|---|---|---|---|
| German Democratic Republic | .60 | Federal Republic of Germany | .73 |
| Czechoslovakia | .57 | United Kingdom | .71 |
| | | France | .65 |
| | | Austria | .60 |
| U.S.S.R. | .48 | Italy | .53 |
| Poland | .45 | Ireland | .53 |
| Hungary | .44 | Spain | .46 |
| Bulgaria | .43 | | |
| Romania | .36 | Greece | .40 |
| | | Portugal | .35 |
| | | Yugoslavia | .32 |

Some key bilateral comparisons yield the following results:

GDR/FRG = .83
Hungary/Austria = .73
Romania/Yugoslavia = 1.12

The GDR/FRG comparison is highlighted for the obvious reasons. The Hungary/Austria comparison is particularly important because detailed computations were made of the relative development levels of the two countries in 1937 (they were joined in the Austro-Hungarian Monarchy until after World War I so their statistical practices were similar), when Hungary's per capita GNP was found to be 63% of Austria's [*Economic Survey of Europe, 1948*]. Because according to official statistics, Hungary has grown somewhat more rapidly than Austria during the postwar period [World, Table 1], it would be plausible to find Hungary not falling behind Austria relative to their prewar income levels.

Romania is juxtaposed with Yugoslavia because the latter country is often considered—for geographic and systemic reasons—to be the most appropriate non-CMEA reference country for Romania as well as Bulgaria.

*PPP-1975.* The basic CPE-MTE patterns are very similar to those found by the physical indicators method, even though the approach and the measuring scales are entirely different.

The most directly relevant bilateral comparisons, however, show the CPE/MTE ratios to be somewhat lower, in part probably reflecting the physical indicator method's CPE bias. This of course does not preclude that the PPP-based estimates themselves may have a similar CPE bias.

*ERDI-Adjusted-PPP-1980.*—First it is important to note the big jump in the developed MTE/US ratios, reflecting primarily the rapid appreciation of several West European currencies against the dollar. The average depreciation in the foreign exchange value of the dollar in terms of a basket of world currencies between 1975 and 1980 is reflected in the ERDIs applied to the CPEs, but some West European currencies appreciated vis-a-vis the dollar much more rapidly than the average. For example, between 1975 and 1980, the FRG/US ratio jumped from .83 to 1.20, the France/US ratio from .82 to 1.03, the Austria/US ratio from .70 to .90, and so on.

| | | | |
|---|---|---|---|
| German Democratic Republic | .52 | Federal Republic of Germany | 1.20 |
| Czechoslovakia | .42 | France | 1.03 |
| | | Austria | .90 |
| | | United Kingdom | .70 |
| U.S.S.R | .37 | Italy | .57 |
| Hungary | .39 | Spain | .47 |
| Poland | .33 | Ireland | .43 |
| Romania | .24 | Greece | .23 |
| | | Yugoslavia | .23 |
| | | Portugal | .21 |

German Democratic Republic/Federal Republic of Germany = .43.
Hungary/Austria = .43.
Romania/Yugoslavia = 1.04.

The large fluctuation in currency values is an important reason for the substantial decline in the bilateral CPE/West European MTE ratios. For example, if the FRG/US and Austria/US ratios would have been the same in 1980 as in 1975, the GDR/FRG ratio would be .70 instead of .43 and the Hungary/Austria ratio .57 not .43. Even taking this account, the CPE/MTE ratios are low, probably approaching the low end of what experts would consider to be still within a plausible range. For example, the USSR's per capita income is less than two-fifth that of the US, while Hungary's and Poland's per capita incomes are 68% and 58% respectively, of Italy's. The point is that the adjusted PPP convertors can not be said to yield implausibly high dollar per capita incomes; if anything, the estimates appear to be on the low side. However, one may argue that the estimates are acceptable, in part because they are so strongly influenced by the exchange rate fluctuations of MTEs and in part because the dollar GNP levels of the middle income CPEs are still significantly higher than those, for example, of Greece, Portugal, and Yugoslavia.

*Commercial exchange rates.*—Use of these official exchange rates yields estimates that cannot be considered plausible relative to those of MTEs:

| | | | |
|---|---|---|---|
| | | Federal Republic of Germany | 1.20 |
| | | France | 1.03 |
| | | Austria | .90 |
| | | United Kingdom | .70 |
| German Democratic Republic | .35 | Italy | .57 |
| Bulgaria | .31 | Spain | .43 |
| U.S.S.R | .30 | Ireland | .43 |
| Hungary | .18 | Greece | .23 |
| Czechoslovakia | .17 | Yugoslavia | .23 |
| Poland | .14 | Portugal | .21 |
| Romania | .14 | | |

German Democratic Republic/Federal Republic of Germany = .29.
Hungary/Austria = .20.
Romania/Yugoslavia = .59.

Exchange rate conversion changes the ranking of the CPEs, Bulgaria becoming the CMEA's second most highly developed country, etc., as has been noted. The results place the GDR significantly below Italy, Spain, and Ireland; and Hungary and Czechoslovakia much below Greece, Yugoslavia, and Portugal. Exchange rate conversions which yield a GDR/FRG ratio of .29, a Hungary/Austria ratio of .20, and a Romania/Yugoslavia ratio of .59 are estimates for CPEs that cannot be considered to fall within the plausible range, even if one takes into account the overvaluation of many West European currencies.

*Tourist exchange rates.*—The following tabulation reveals the pattern if the official tourist exchange rates of the CPEs are used as convertors.

| | | | |
|---|---|---|---|
| German Democratic Republic | 63 | Federal Republic of Germany | 1.20 |
| | | France | 1.03 |
| | | Austria | .90 |
| | | United Kingdom | .70 |
| Czechoslovakia | .35 | Italy | .57 |
| U.S.S.R | .30 | Spain | .47 |
| Hungary | .27 | Ireland | .43 |
| Bulgaria | .21 | Greece | .23 |
| Poland | .20 | Yugoslavia | .23 |
| Romania | .20 | Portugal | .21 |

German Democratic Republic/Federal Republic of Germany=.53.
Hungrary/Austria=.30
Romania/Yugoslavia=.89.

Although the pattern is somewhat improved as compared with the preceding one, it is important to note that recently Hungary and Poland both discarded their separate tourist exchange rates and designated the commercial exchange rate as the unified, single, official exchange rate. Thus, the use of the tourist exchange rate cannot be considered a realistic alternative set of convertors for the CPEs as a group.

### 4. *Conclusions and qualifications*

Finding the appropriate convertor for CPEs is an exceedingly difficult problem which cannot be solved fully satisfactorily, for a variety of conceptual and practical reasons. One important problem is that even for many MTEs, there is no single convertor that is well suited to serve both as an equilibrium exchange rate and to obtain that dollar value of per capita GNP that would rank the country's level of development correctly among the family of nations. In this respect, the task of this study was a limited one: to identify or to compute that set of convertors that could be applied uniformly to all or to a large subgroup of CPEs to yield plausible per capita dollar GNP estimates for 1980.

There is no scientific test to assess the accuracy of a set of convertors for CPEs. It is largely a matter of judgment, which, in this study has been guided by the plausibility of the resulting per capita dollar GNP figures. According to each of several plausibility criteria employed, the set of convertors based on adjusted PPPs yield results that are more plausible than those obtained when employing any other possible convertor. Plausible per capita dollar GNP estimates probably could have been obtained also via the physical indicators method, but those who in the past were responsible for preparing such estimates have discontinued making them. The scale of the effort required to apply this method exceeded the time and resources available for this study.

To be sure, it cannot be claimed that the adjusted PPP method necessarily yields the most accurate estimates for each country. First, in the absence of an internationally agreed upon and universally applied method of PPP computations, fully accurate convertors are not available even for MTEs. Using the prevailing exchange rates as convertors for MTEs is itself a "second best" solution, a compromise. Although there is a correlation between PPPs and prevailing exchange rates which appears to be a function of the level of per capita income, the theoretical and empirical issues of what determines a country's ERDI have not been fully resolved up to now. More importantly, at any given time there are many MTEs, especially among the less developed countries, whose prevailing exchange rates deviate considerably from levels that would be predicted by the application of the adjusted PPP method. Therefore, insisting that for all CPEs the only correct convertor is that derived by the adjusted PPP method would mean setting a higher standard for them than the World Bank, for instance, sets for MTEs when it publishes the *Atlas* and uses the per capita dollar GNP figures for operational purposes.

Regarding the matter of confidence in the CPE estimates based on the adjusted PPP convertors, it is worth recalling that the ERDIs on which these convertors are partly based were derived from regression equation [2], which had a wide confidence interval. The statistical uncertainty regarding the calculation of the ERDIs for CPEs implies a corresponding uncertainty regarding the values of the "adjusted PPP" convertors and the resulting dollar per capita income estimates. Putting aside all data and other statistical problems, the uncertainties in estimating the ERDIs alone mean that one can be about 95% certain that the true estimates lie within the following range:

| | Convertor (NCU/$) | | | Per capita dollar GNP | | |
|---|---|---|---|---|---|---|
| | Low | Best | High | Low | Best | High |
| GDR | 1.67 | 2.20 | 3.27 | 4,000 | 5,910 | 7,800 |
| Czechoslovakia | 5.87 | 7.78 | 11.80 | 3,100 | 4,740 | 6,300 |
| Hungary | 11.21 | 15.22 | 23.60 | 2,830 | 4,390 | 5,960 |
| Poland | 13.87 | 18.73 | 29.03 | 2,400 | 3,730 | 5,040 |
| U.S.S.R. | .39 | .53 | .82 | 2,700 | 4,190 | 5,700 |
| Romania | 7.37 | 10.40 | 17.77 | 1,570 | 2,680 | 3,800 |

The extreme values presented do not of course mean that a country's GNP level has an equal probability of being anywhere within the range; the highest probabilities cluster around the "best" (midpoint) estimates that have actually been used. But, hypothetically speaking, if a CPE were a MTE, especially a less developed MTE (see Figure 2), there would be some probability that it would have a prevailing exchange rate yielding a per capita dollar GNP estimate somewhere within the wide range indicated.

### *C. Implications when a CPE joins the World Bank*

An extremely difficult problem arises when a CPE joins the World Bank and has a prevailing exchange rate substantially different from that derived via the adjusted PPP method, as is the case with Hungary, which joined in 1982. In deciding which convertor to accept for operational or *Atlas* purposes, an important consideration is whether the exchange rate of the CPE actually performs several of the basic *economic* functions that prevailing exchange rates perform in MTEs. Key considerations in this regard are whether the country has a uniform or a multiple exchange rate system, whether and to what extent its prevailing exchange rates actually link foreign and domestic prices, whether enterprises have a significant degree of freedom regarding where, what, and at what price to export and import, and if so, whether profit maximization at the firm level is an important basis for production and trade decisions.

I have tried to examine these issues for each CPE [Marer, 1985], being hindered of course by lack of full information on the price, exchange rate, and economic decision-making systems of most CPEs. Nevertheless, it can be shown that CPEs have a variety of systems, which are periodically changed in most countries. For example, there appears to be no direct link between foreign and domestic prices in the USSR, the GDR, and Cuba; some linkage in Bulgaria, Czechoslovakia, Poland and (since 1981) Romania; and substantial linkage since 1980 in Hungary. An important aspect of the linkage is whether a unified or a multiple exchange rate system operates, since multiple exchange rates and tax/subsidy schemes are interchangeable. Hungary's system is the most like that of a MTE; one major difference is that there appears to be only a weak link in Hungary between the foreign and domestic prices of non-traded goods, another that the structure of Hungarian prices is still quite different than the structure of world market prices.

### *D. Differences between purchasing power parties and exchange rates in CPEs: The case of Hungary*

It is striking to find that there are very large differences in the Western-computed PPPs and the prevailing (commercial or tourist) exchange rates of several East European countries, notably, of Hungary, Poland and Romania. The instant reaction of many economists in these countries is that the PPP computations must be way off. This matter, however, appears to be not that simple. Let's take the case of Hungary, whose price and exchange rate systems and policies are well documented in its own literature.

A very important feature of the Hungarian price system is that agricultural commodities and consumer goods are relatively low priced and industrial products are relatively very high priced. Whereas during the 1950s the Hungarian price structure was the traditional CPE type in that net turnover taxes levied on agricultural and industrial consumer goods before they reached the consumer provided much of the revenue for the state budget, since 1968 much of the state income is generated by the various direct and indirect levies paid by industrial producers. Levies on producers of course raise the industrial wholesale price, while increasing subsidies hold down consumer prices, creating the anomaly of producer and consumer price levels being nearly identical [Csikós-Nagy and Rácz]:

*Percent difference: Consumer vs. producer price levels*

| | |
|---|---|
| 1949 | +18 |
| 1952 | +63 |
| 1959 | +18 |
| 1968 | +5 |
| 1972 | +3 |
| 1975 | 0 |
| 1976 | −3 |
| 1978 | −4 |
| 1980 Jan. 1 | +3 |
| 1980 | +1 |
| 1981 | +0.5 |

Thus, in 1968 the consumer price level exceeded the producer price level only by 5%. In 1975 the two were identical, in subsequent years one or the other price levels became higher by a few percentage points. (Behind this average relationship we find that consumer prices generally exceed producer prices for industrial goods and remain below producer prices for foodstuffs, transportation, communications, and a number of services, which continue to be subsidized through the state budget.)

The forint/$ exchange rate introduced in 1968 (called the FTM until 1976) was based approximately on the average domestic cost of earning a dollar in convertible currency exports. Between 1968 and 1981, the basic principle of Hungary's exchange rate policy was to adjust the rate to moderate the influence of foreign inflation on domestic producer prices. According to calculations made by the IMF, Hungary's effective exchange rate index (exchange rate adjusted for inflation in Hungary and the weighted average inflation in its main Western trade partner countries) showed no particular trend between 1970 and 1981, with periods of depreciation (1970–74 and 1977–79) alternating with periods of appreciation (1975–76 and 1980–81) [IMF, p. 18]. Thus, in 1980 Hungary's prevailing commercial exchange rate still reflected the relationship the FTM expressed in 1968. Although in the FTM, the comparison is made only for *traded* goods, the peculiar feature of the practical identity of the producer and consumer price *levels* just documented means as if consumer not producer prices were used in the numerator of the FTM.[16] Thus, if the FTM were to be computed to approximate the PPP of exports, the appropriate analog in the denominator would be Hungary's export basket valued at Western *retail* prices. But in fact, the prices actually used in the denominator of the FTM are several layers lower:

Western retail prices of Hungary's exports
Less: retail markup and taxes on consumption
Equals: Western wholesale prices
Less: Wholesale markup and taxes
Equals: Western importer's domestic price
Less: Tariffs, other border charges and importer's markup

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[16] Since production for convertible currency export involves extra cost, it is possible that the average price in the numerator is even significantly higher than retail prices.

Equals: Price at border of importing country

Less: CPE price differential (difference between the price a CPE and a non-CPE exporter receives for comparable products)

Equals: Hungary's export price

Less: Direct and indirect costs of Hungary's foreign trade operations (subtracted when computing the FTM)

Equals: Price in the denominator of the FTM

Thus, it is not surprising to find a very large discrepancy between Hungary's FTM-based exchange rate and PPP even for traded goods; the PPP for all tradables and nontradables (GNP) would of course be even lower because services are relatively low priced in Hungary, as in the other CPEs.

## IV. GROWTH RATES

### *A. Shortcomings of official growth rates of CPEs*

The official growth rates of CPEs are calculated with prices that are distorted and according to methods of index number construction that tend to yield varying degrees of upward bias. The degree of bias is considered by independent experts to be so substantial for some CPEs as to lead to the conclusion that the official NMP or the NMP-based GNP growth rates of *CPEs taken as a group* cannot be compared meaningfully with the GNP growth rates of MTEs.

CPEs rely on the double deflation method: both the value of gross output and the value of material purchases and depreciation are deflated by the relevant price indices. Gross value is typically overstated and the price indices used to deflate them are downward biased so that the resulting constant price series will be upward biased. The main reason why CPE price indices are downward biased is their method of introducing "new" products. Since enterprise plan fulfillment is measured in "constant" prices, products are often redesigned slightly by firms and labeled new products, then introduced at significantly higher prices, so that "constant price" output will have a higher value. More generally, new products tend to be priced at higher introductory rather than lower serial production prices. Lack of a strong, independent, scientific tradition in the central statistical offices of some countries may encourage the subordination of statistical integrity to political consideration. To be sure, there are significant differences among the CPEs regarding the presence and importance of these factors, with corresponding impact on their growth rate statistics, as detailed in [Marer 1985, Section VI-G].

### *B. Alternative computations*

Prompted by these and other shortcomings in the official statistics, considerable effort has been devoted in the West to develop alternative measures, using official data exclusively, but replicating as much as possible commonly accepted standards of valuation and index number construction in MTEs. The basic Western approach is to aggregate the official physical output series into branch, sector and GNP indices, using weights constructed from official data according to the adjusted factor cost standard pioneered during the 1950s by Abram Bergson, summarized in [Marer 1985, Section VI-D].

Implementing the alternative approach is hindered by gaps in published data that are very serious for some countries. A further problem is that the approach may not measure adequately quality improvements and the introduction of new products so that the resulting growth indices may be downward biased.

### *C. Conclusions*

There was no consensus among the country experts on whether the official or the independently computed growth rates would be preferable to use. The view that the official growth rates are significantly upward biased is unequivocal for all CPEs except Hungary; the country expert on Hungary was not certain. Most country experts, however, stopped short of endorsing the alternative growth computations, either because it was believed that those may be downward biased for the reason mentioned, but more often because they have not been able to resolve satisfactorily concrete questions about the application of the method to their countries. For the USSR, the basic data available from official sources, while not without gaps, has been adequate; considerable resources have been devoted to making the alternative estimates, which are well documented and evaluated against the official indices; and include sensitivity analyses in the sectors that present especially difficult statistical problems. These considerations have led the country expert unequivocally to prefer them over the official series. The country authors on Czechoslovakia, the GDR, Poland, and Romania consider the recomputed Western indices more plausible but stop short of endorsing their use at this time, until the questions they have raised about them are resolved. The adjustments to the official data made by the experts on Bulgaria reduced significantly the official index, but the adjusted figures may still be upward biased. The country authors on Cuba have an insufficient data basis to recommend any set of growth statistics.

## APPENDIX TABLES

TABLE 1.—U.S.S.R.: RUBLE/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARITIES, 1961, 1970–81

| Year | Official exchange rate | Foreign trade multipliers [1] |  | Soviet-computed PPP for NMP, Soviet weights | U.S.-computed PPP for GNP |  |  | FRG-computed PPP for private consumption |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Exports | Imports |  | Soviet weights | U.S. weights | Geo. ave. | Soviet weights | FRG weights | Geo. ave. |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 1961 | .90 |  |  | (.90) |  |  |  |  |  |  |
| 1970 | .90 | 1.79 | 2.36 | .76 |  |  |  | .85 | 1.11 | .97 [3](.85) |
| 1971 | .90 | 1.50 | 2.36 |  |  |  |  | .77 | 1.01 | .88 |
| 1972 | .82 | 1.40 | 2.36 |  |  |  |  | .67 | .88 | .77 |
| 1973 | .74 | 1.28 | 2.44 |  |  |  |  | .52 | .68 | .59 |
| 1974 | .76 | 1.12 | 2.21 |  |  |  |  | .48 | .62 | .55 |
| 1975 | .72 | .95 | 2.04 |  |  |  |  | .43 | .56 | .49 [3](.57) |
| 1976 | .75 | .88 | 2.12 | .62 [2](.41) | .40 | .60 | .49 | .42 | .55 | .48 |
| 1977 | .74 | .82 | 2.16 | .60 |  |  |  | .37 | .48 | .42 |
| 1978 | .68 | .81 | 2.27 |  |  |  |  | .32 | .41 | .36 |
| 1979 | .66 |  |  |  |  |  |  | .28 | .36 | .32 [3](.45) |

## APPENDIX TABLES—Continued

| Year | Official ex-change rate | Foreign trade multipliers [1] |  | Soviet-computed PPP for NMP, Soviet weights | U.S.-computed PPP for GNP |  |  | FRG-computed PPP for private consumption |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Exports | Imports |  | Soviet weights | U.S. weights | Geo. ave. | Soviet weights | FRG weights | Geo. ave. |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 1980 | .65 |  |  |  |  |  | [4] (.40) |  |  |  |
| 1981 | .72 |  |  |  |  |  |  |  |  |  |

---

[1] Western computed, for all trade.

[2] Weighted average of Soviet-computed PPP for NMP, Soviet weights, and U.S.-computed PPP for services, Soviet weights [Campbell], p. 28.

[3] Converted at ICP-based rate.

[4] Moved to 1980 by multiplying by the ratio of U.S.S.R. to US GNP deflators, U.S.S.R. GNP deflator estimated as the difference between GNP growth in current prices [Campbell, table 6] and in constant prices [U.S.S.R., table A-1].

Sources: col. (1): Time-weighted average of official quotations reported in *Ekonomiceskaja gazeta*, shown in [van Brabant] table 2; cols. (2) and (3): [Treml and Kostinsky], p. 15; col. (4)-(7): [Campbell]; cols. (8)-(10): [Internationaler], 1981, converted to dollars at the $/DM rate shown in [Havlik and Levcik], table 19, row (5).

## TABLE 2.—BULGARIA: LEVA/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARITIES, 1970-81

| Year | Official exchange rate | For trade multiplier |  | Tourist (noncommercial) exchange rate | UN cost of living index |  |
|---|---|---|---|---|---|---|
|  |  | Exports | Imports |  | Including housing [1] | Excluding housing [1] |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| 1970 | 1.170 | [2] 1.76 | [2] 1.82 | 2.000 |  |  |
| 1971 | 1.170 |  |  | 2.000 |  |  |
| 1972 | 1.078 |  |  | 1.843 |  |  |
| 1973 | .988 |  |  | 1.689 |  |  |
| 1974 | .970 |  |  | 1.574 |  |  |
| 1975 | .969 |  |  | 1.161 | 1.13 | 1.04 |
| 1976 | .966 |  |  | .966 | 1.10 | 1.02 |
| 1977 | .948 |  |  | .948 | .99 | .92 |
| 1978 | .892 |  |  | 1.024 | .96 | .90 |
| 1979 | .865 |  |  | 1.298 | .92 | .87 |
| 1980 | .857 | [3] (1.12) | [3] (1.16) | 1.286 | .85 | .82 |
| 1981 | .922 |  |  | 1.383 | .92 | .98 |

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[1] Housing consists of rent, utilities, service.

[2] Calculated for total exports and imports, that is, predominantly ruble-denominated transactions.

[3] Estimated by moving 1970 data via the state retail price index (proxy for GNP deflator) and U.S. GNP deflator.

Sources: Col. (1): [van Brabant], table 2; cols. (2) and computed from values shown in domestic prices [*UN, Yearbook of National Income Statistics, 1980*, vol. I] divided by values shown in devisaleva prices (Bulg. Stat. Yearbooks), multiplied by the official exchange rate; col. (4): [van Brabant], table 4; cols. (5) and (6): calculated on the basis of the exchange rate and index, shown in [*Monthly*], various issues.

## TABLE 3.—CZECHOSLOVAKIA: CROWN/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARITIES, 1970-81

| Year | Official ex-change rate | FTM (exports) | Tourist (noncommercial) exchange rate |  | Purchasing power parities for consumer goods and services |  | UN costs of living index |  |
|---|---|---|---|---|---|---|---|---|
|  |  |  | A | B | By country experts (Geo. Ave. of Aust. and Czechoslovakia weights) | By CSO of FRG (FRG weights) | Including housing | Excluding housing |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1970 | 7.20 | 28.70 | 16.20 | 16.09 | 8.98 | 12.70 [1] (11.10) |  |  |
| 1971 | 7.20 |  | 16.20 | 15.49 | 7.75 | 11.46 |  |  |
| 1972 | 6.61 |  | 14.90 | 14.82 | 7.77 | 9.88 |  |  |
| 1973 | 5.86 |  | 13.26 | 13.04 | 7.75 | 7.74 |  |  |
| 1974 | 5.86 |  | 10.25 | 10.86 | 7.71 | 7.06 |  |  |

## TABLE 3.—CZECHOSLOVAKIA: CROWN/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARITIES, 1970–81—Continued

| Year | Official exchange rate (1) | FTM (exports) (2) | Tourist (noncommercial) exchange rate: A (3) | Tourist (noncommercial) exchange rate: B (4) | Purchasing power parities for consumer goods and services: By country experts (Geo Ave. of Aust. and Czechoslovakia weights) (5) | Purchasing power parities for consumer goods and services: By CSO of FRG (FRG weights) (6) | UN costs of living index: Including housing (7) | UN costs of living index: Excluding housing (8) |
|---|---|---|---|---|---|---|---|---|
| 1975 | 5.58 | | 9.77 | 10.56 | 7.67 [1] (7.59) | 6.38 [1] (7.47) | 9.07 | 9.00 |
| 1976 | 5.77 | | 10.11 | 9.27 | 7.60 | 6.29 | 9.00 | 8.86 |
| 1977 | 5.67 | | 9.92 | 8.87 | 7.51 | 5.65 | 8.54 | 8.43 |
| 1978 | 5.43 | | 9.48 | 8.60 | 7.39 | 4.85 | 8.27 | 8.38 |
| 1979 | 5.32 | | 9.31 | 8.48 | 7.11 | 4.39 | 8.01 | 8.33 |
| 1980 | 5.38 | (19.23) | 9.40 | 10.53 | 6.91 [1] (7.86) | 4.27 [1] (5.85) | 7.73 | 8.35 |
| 1981 | 5.89 | | 10.29 | | | | 7.33 | 8.26 |

[1] Converted at ICP-based rate.

Source: Col. (1): [Havlik and Levcik], table 19, row 1; col. (2), 1970: *Politicka Ekonomie*, 1974, p. 744, moved to 1980 by Czech and U.S. price deflators, the former estimated by the country experts [Havlik and Levcik], pp. 25–26; col. (3): computed by applying the premia to the official exchange rate [van Brabant], table 4; col. (4): Kcs/Austrian schilling rate converted at the prevailing schilling/dollar rate [Havlik and Levcik], table 19, row 8; cols. (5) and (6): [Havlik and Levcik], table 19; cols. (7)-(8): Calculated on the basis of the exchange rate and index shown in [*Monthly*], March 1982, special table.

## TABLE 4.—CZECHOSLOVAKIA: CROWN/DOLLAR PURCHASING POWER PARITIES DERIVED FROM BILATERAL COMPARISONS WITH AUSTRIA AND THE FEDERAL REPUBLIC OF GERMANY, 1970, 1975 AND 1980

| Method of computation | 1970 | 1975 | 1980 |
|---|---|---|---|
| Based on bilateral comparison with Austria (ave. of Czechoslovak and Austrian weights): | | | |
| 1. Backdated by Czechoslovak inflation estimated by country experts, Austrian inflation and official (ICP) AS/$ | NA | 10.35 (9.66) | 6.87 (7.86) |
| 2. Backdated by official Czechoslovak and Austrian inflation and official (ICP) AS/$ | NA | 11.23 (10.48) | 6.87 (7.86) |
| 3. Backdated by Czechoslovak inflation estimated by country experts and U.S. inflation | 10.26 (11.74) | 8.43 (9.64) | 6.87 (7.86) |
| 4. Backdated by official Czechoslovak and U.S. inflation | 11.90 (13.63) | 9.14 (10.46) | 6.87 (7.86) |
| Based on bilateral comparison with the FRG: | | | |
| 1. CSO of FRG series (whose apparent method of updating 1970 base is to revalue the basket at Czech. and FRG prices) converted at official (ICP) DM/$ rates: | | | |
| (a) FRG weights | 12.70 (11.10) | 6.38 (7.47) | 4.27 (5.85) |
| (b) Estimated ave. of FRG and Czechoslovak weights | 11.10 (9.32) | 5.58 (6.27) | 3.73 (4.91) |
| 2. Updated by Czechoslovak inflation rate estimated by country experts and U.S. inflation: | | | |
| (a) FRG weights | 12.70 (11.10) | 10.64 (9.30) | 8.51 (7.44) |
| (b) Estimated ave. of FRG and Czechoslovak weights | 11.10 (9.32) | 9.30 (7.81) | 7.44 (6.25) |
| 3. Updated by official Czechoslovak and U.S. inflation: | | | |
| (a) FRG weights | 12.70 (11.10) | 9.80 (8.57) | 7.33 (6.41) |
| (b) Estimated ave. of FRG and Czechoslovak weights | 11.10 (9.32) | 8.57 (7.20) | 6.41 (5.38) |

Source: [Marer, 1985], part IV-D.

## TABLE 5.—GDR: MARK/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARTIES, 1970–81

| Year | Official exchange rate | Pro forma commercial exchange rate | Tourist (noncommerical) exchange rate | PPP for GNP and components | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | GNP | Cons. | Invest. | Govt | Trade bal |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1970 | 1.17 | 4.20 | 3.66 | | | | | |
| 1971 | 1.17 | 4.20 | 3.43 | | | | | |
| 1972 | 1.08 | 3.87 | 3.18 | | | | | |
| 1973 | .99 | 3.48 | 2.67 | | | | | |
| 1974 | .97 | 3.48 | 2.59 | | | | | |
| 1975 | .97 | 3.48 | 2.46 | | | | | |
| 1976 | .97 | 3.48 | 2.52 | | | | | |
| 1977 | .95 | 3.48 | 2.32 | | | | | |
| 1978 | .89 | 3.48 | 2.01 | | | | | |
| 1979 | .87 | 3.48 | 1.83 | | | | | |
| 1980 | .86 | 3.30 | 1.82 | 1.96 | 2.3 | 1.9 | 1.5 | 4.0 |
| 1981 | .92 | 3.32 | 2.26 | | | | | |

Sources: Col. (1): Gold parity quoted in Czechoslovakia's statistical yearbook, adjusted by the same relatives as the commercial rate changed, in [van Brabant, table 2]; col. (2): implied average rate between dollar data reported to the United Nations and official trade data in Valutamark, in [van Brabant, table 3]; col. (3): no official tourist rate, but since tourist rates are normally quoted at parity with the DM, the rate shown is that of the official DM/$, quarterly average; cols. (4)–(8): [Collier, table XIX].

## TABLE 6.—HUNGARY: FORINT/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARITIES, 1970–81

| Year | Official exchange rate | Commercial exchange rate | FTM (export) | Tourist (Noncommer) exchange rate | ICP-Computed PPPs | | | | FRG-computed PPP (FRG weights) | UN cost of living index | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | GOP | Cons. | Cap. form | Govt. | | Including housing | Excluding housing |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| 1970 | 11.74 | | 60.00 | 30.00 | | | | | 22.10 | | |
| 1971 | 11.74 | | 60.00 | 30.00 | | | | | 20.50 | | |
| 1972 | 10.81 | | 55.26 | 27.63 | | | | | 18.17 | | |
| 1973 | 9.39 | | 48.71 | 24.35 | | | | | 14.66 | | |
| 1974 | 9.15 | | 48.71 | 24.35 | | | | | 13.56 | | |
| 1975 | 8.60 | | 43.97 | 20.65 | 12.3 | 11.1 | 17.6 | 10.7 | 12.62 [3](14.77) | | |
| 1976 | (1) | 41.57 | (1) | 20.80 | | | | | 13.00 | 19.83 | 19.21 |
| 1977 | | 40.92 | | 20.50 | | | | | 12.00 | 19.79 | 19.37 |
| 1978 | | 38.01 | | 18.94 | | | | | 10.56 | 19.23 | 19.23 |
| 1979 | | 35.58 | | 20.30 | | | | | 10.00 [3](14.00) | 19.50 | 19.90 |
| 1980 | | 32.43 | | 22.14 | [4] 11.8 | | | | NA | 19.30 | 20.92 |
| 1981 | | 34.34 | | 31.00 | | | | | NA | 20.40 | 23.90 |
| 1981 | | [2] 35.00 | | [2] 35.00 | | | | | | | |

[1] Discontinued.

[2] As of Oct. 1.

[3] Converted at ICP-based rate.

[4] Moved to 1980 from 1975 via the Hungarian consumer price index and the U.S. GNP deflator.

Sources: Cols. (1)–(4): Average monthly rates officially published by the Hungarian National Bank (direct communication received); cols. (5)–(8), 1975: [Kravis, et al., 1982], table 1-9; 1980: Multiplied by ratio of Hungarian and U.S. price indices; col. (9): [Internationales], 1981, converted at the offical $/DM rate shown in [Havlik and Levcik], table 19, row (5).

## TABLE 7.—POLAND: ZLOTY/DOLLAR EXCHANGE RATES, 1970–82

| Year | Official exchange rate (1) | "Special" commercial exchange rate (2) | Commercial exchange rate (3) | FTM (exports) (4) | Tourist (noncommercial exchange rate (5) |
|---|---|---|---|---|---|
| 1970 | 4.00 | 24.00 | | | 40.00 |
| 1971 | 4.00 | 24.00 | NA | 54.00 | 40.00 |
| 1972 | 3.68 | 22.08 | NA | 50.78 | 36.80 |
| 1973 | 3.36 | 20.18 | NA | 41.50 | 33.65 |
| 1974 | 3.32 | 19.92 | NA | 31.87 | 33.20 |
| 1975 | 3.32 | 19.92 | [1] (50.00) | 31.21 | 33.20 |
| 1976 | 3.32 | 19.92 | NA | 38.84 | 33.20 |
| 1977 | 3.32 | 19.92 | NA | 40.17 | 33.20 |
| 1978 | 3.24 | 30.94 | NA | 38.94 | 32.44 |
| 1979 | 3.10 | 30.95 | NA | 35.83 | 30.95 |
| 1980 | 3.05 | 30.49 | 45.00 | 34.82 | 30.49 |
| 1981 | 3.35 | 33.50 | 50.00 | NA | 33.50 |
| 1982 [2] | 80.00 | 80.00 | 80.00 | 80.00 | 80.00 |

[1] The approximate value indicated by Polish economists to the author of this report.

[2] Jan. 1, 1982.

Sources: Col. (1): [van Brabant], table 2; col. (2): [van Brabant], table 3; col. (3), 1980: [Fallenbuchl], p. 49, 1981: Average of old rate and new rate of 55 introduced on July 1, 1981; col. (4): [Fallenbuchl], table IV-1; col. (5): [van Brabant], table 4.

## TABLE 8.—POLAND: ZLOTY/DOLLAR PURCHASING POWER PARITIES, 1970–81

| Designation | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ICP: | | | | | | | | | | | | |
| GDP | | | | | | 14.3 | | | | | [1] 14.3(13.7) | |
| Consumption | | | | | | 13.2 | | | | | | |
| Capital formation | | | | | | 19.6 | | | | | | |
| Government | | | | | | 11.3 | | | | | | |
| Joint Polish-Austrian CSO: | | | | | | | | | | | | |
| GNP | | | | | | 17.1 | | | 17.2 | | [1] 17.2(19.2) | |
| Consumption | | | | | | 17.6 | | | 17.7 | | | |
| Capital formation | | | | | | 18.3 | | | 18.7 | | | |
| Government | | | | | | 9.3 | | | 9.8 | | | |
| Bilateral Comparisons with France and Austria: | | | | | | | | | | | | |
| GNP | 24.7 | | | | 20.6 | | | | | | [1] 18.0(18.2) | |
| Consumption | 22.5 | 22.6 | 21.9 | 18.9 | 17.6 | | | | | | | |
| Capital formation | | | | | 31.7 | | | | | | | |
| Machinery and equipment | | | | | 40.1 | | | | | | | |
| Construction | | | | | 19.2 | | | | | | | |
| Government | | | | | 15.6 | | | | | | | |
| FRG-computed: | | | | | | | | | | | | |
| Private consumption (FRG weights) | 23.0 | 20.7 | 18.1 | 14.3 | 13.7 | 12.7 [2] (14.8) | 13.0 | 12.0 | 11.0 [2] (14.7) | | | |
| UN-computed: | | | | | | | | | | | | |
| Cost of living, including housing | | | | | | 15.7 | 16.1 | 14.9 | [3] 24.2 | 23.9 | 23.2 | 23.6 |
| Cost of living excluding housing | | | | | | 18.3 | 18.5 | 16.1 | [3] 22.2 | 23.6 | 23.2 | 24.2 |

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[1] Moved to 1980 by index of unit labor costs.

[2] Using ICP-computed geometric average of bilateral PPP's, moved forward by a coefficient of relative prices.

[3] The large jump in the cost of living in zlotys from 1977 (by 62 percent in the first and 38 percent in the second series) does not seem to be warranted by changes in prices in Poland or in the United States, suggesting the possibility of an error.

Sources: ICP, 1975: [Kravis, et al.—1982], table 1–9, moved to 1980 by a coefficient of Polish and U.S. prices, the former represented by the implicit NMP deflator calculated from [Fallenbuchl], table III–8; Joint Polish-Austrian, 1975 and 1978: [Comparison], table 3, converted to dollars by the ICP's geometric average PPP between the schilling and the dollar (their appendix table 7–1), moved to 1978 and 1980 by coefficients of Austrian and United States prices; Bilateral Comparisons with France and Austria, 1970–74: [Fallenbuchl], p. 48, moved to 1980 by the same method as for the ICP; FRG-computed: [Internationale] 1981, converted to dollars at the official DM/dollar rate.

TABLE 9.—ROMANIA: LEU/DOLLAR EXCHANGE RATES AND PURCHASING POWER PARTIES, 1970–82

| Year | Offical exchange rate | Commercial exchange rate | Foreign trade multiplier |  | Tourist (noncommercial) exchange rate | ICP-computed PPP |  |  |  | UN-cost of living |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Exports | Imports |  | GDP | Cons | Cap. form | Govt | Including housing | Excluding housing |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| 1970 | 6.00 | 24.00 | 24.00 | NA | 18.00 |  |  |  |  |  |  |
| 1971 | 6.00 | 24.00 | 24.00 | NA | 18.00 |  |  |  |  |  |  |
| 1972 | 5.52 | 24.00 | 24.00 | NA | 16.00 |  |  |  |  |  |  |
| 1973 | 5.04 | [1] 20.00 | 22.60 | 20.30 | 14.58 |  |  |  |  |  |  |
| 1974 | 4.97 | 20.00 | 18.20 | 20.90 | 13.79 |  |  |  |  |  |  |
| 1975 | 4.97 | 20.00 | 18.84 | 18.28 | 12.00 | 8.8 | 7.6 | 12.9 | 6.7 | 11.3 | 11.2 |
| 1976 | 4.97 | 20.00 | 19.93 | 19.86 | 12.00 |  |  |  |  | 11.5 | 10.9 |
| 1977 | 4.97 | 20.00 | 18.51 | 18.12 | 12.00 |  |  |  |  | 11.0 | 10.4 |
| 1978 | 4.56 | [2] 18.00 | 17.26 | 16.60 | 12.00 |  |  |  |  | 10.8 | 10.6 |
| 1979 | 4.47 | 18.00 | 12.73 | 11.92 | 12.00 |  |  |  |  | 10.4 | 10.4 |
| 1980 | 4.47 | 18.00 | 12.16 | 9.88 | 12.00 | 6.3 |  |  |  | 10.2 | 10.2 |
| 1981 | (3) | 15.00 | 14.50 | 12.60 | [4] 11.00 |  |  |  |  | 11.8 | 9.7 |
| 1982 |  | [5] 16.50 |  |  |  |  |  |  |  |  |  |

[1] Introduced Dec. 3, 1973. If the FTM is considered the commercial exchange rate, the time-weighted average would be 20.25.

[2] Changed to 18.00 on Mar. 6, 1978 so that a time-weighted average for the year would be 18.36.

[3] Discontinued.

[4] Changed Feb. 15, 1981. The time-weighted average rate for the year is 11.125.

[5] As of Jan. 1, 1983, changed to 17.50 on July 1, 1983, when the rates were unified.

Sources: Col. (1): 1970–72: [van Brabant], table 2, 1973–81: IMF, as cited in [Jackson], tables 43 and 44; col. (2): [Jackson], table 44, supplemented by information in [van Brabant], table 3; cols. (3)–(4): 1970–72: [van Brabant], table 4; 1973–81: [Jackson], table 44; cols. (6)–(9), 1975: [Kravis, et al.—1982], table 1-9; 1980; adjusted for relative price movements (Romania's as shown in [Jackson], table 44); cols. (10)–(11): [*Monthly*], various issues; 1982: private communication from Mr. Jackson.

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## Section C. Industry and Employment

# INDUSTRIAL POLICY IN EAST EUROPE: A COMPARISON OF POLAND, CZECHOSLOVAKIA, AND HUNGARY

By Josef C. Brada* and J. Michael Montias**

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## SUMMARY

Many developed and developing countries have sought to duplicate the successful experience of Japan in promoting export-oriented industries. The promotion of industries that are likely "winners" in the international market place is commonly called industrial policy. A successful industrial policy has four elements; the choice of industries to be supported; a selection of reference markets these industries are to serve; the allocation of resources to priority industries; and the ability to produce and market the output of these industries.

In this paper we examine the success of industrial policies in three centrally planned economies, Czechoslovakia, Hungary and Poland. Although criteria for selecting industries differed from country to country, the industries selected for priority development did not differ much. The targeted market was the CMEA, with the exception of Poland which followed a more western oriented policy. In all countries there were difficulties in allocating resources to the priority sectors. Finally, the outcomes of industrial policies were severely hampered by the disfunctional nature of enterprise incentives.

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## I. INTRODUCTION

This paper reports the first results of our study of industrial policy in Czechoslovakia, Hungary and Poland. We have begun to investigate the historical antecedents of these policies (what sort of policies did decision-makers in these countries conceive? how did they plan to go about carrying them out?) and the statistical analysis of the outcomes (to what extent did the concentration of investments, growth of output and exports reflect the policies that were put in place?) Because the subject is new—at least as it pertains to Eastern Europe—we have been obliged to resort to techniques of analysis (especially in our statistical investigation) that have not yet proved their validity. Our analytical and statistical conclusions should therefore be considered tentative, hardly more than a first stab at a complex problem.

A "positive industrial policy" may be defined as a set of coherent government efforts to promote the rapid and successful development of industries (or sub-industries) that either are expected to become established world leaders or that are thought to be critical for the international competitiveness of other industries using the favored industries' output as an input. A "defensive industrial policy" aims at the protection of those industries (thought to be incapable of sustaining competition without government aid) from excessively rapid or socially harmful decline. In this paper we shall concentrate on positive policies, although we may remark in passing that the successful efforts, in a country such as Poland, of high-cost industries to resist shrinkage were due more to their entrenchment and strength in bargaining for resources than to any concerted "defensive policy" on the part of the highest political authorities.

Japan has for some time been regarded as a stellar example of a government's ability to conduct a successful industrial policy. The East European literature on industrial structure and on technology policy also looks approvingly (and wistfully) at the Japanese experience. However, it generally overlooks the fact that Japanese policy—especially in recent years—has frequently been defensive and that much of the solicitude of MITI bureaucrats has been lavished on the problems of declining industries.[1]

An effective industrial policy would seem to consist of the following elements:

*1. Selecting industries for promotion or for shrinkage.*—Perhaps the most controversial aspect of industrial policy is whether the government is indeed better able to select the appropriate industrial sectors to promote or dismantle than is the market, and whether the pace at which government policy redeploys resources is in some sense more efficient than the redeployments brought about by market forces. For many less advanced countries the technological choices are less difficult, but questions regarding the ability to manage new industries and the rate at which advanced countries will yield their markets to new competitors create at least as much uncertainty.

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[1] Japan was the home of 9 of the 14 industries that, among the developed market economies, had the largest percentage employment declines during 1973-1977.

A second difficulty in setting industrial policy is that the choice of sector is often not based on considerations of comparative advantage and on the factor-endowment prescriptions of the Heckscher-Ohlin theory. Rather, most of the industries that have been promoted derive their competitive advantages in large part from economies of scale, advantages in monopolistic competition and the indivisibility of capital stock. While theoretical underpinnings for these bases of comparative advantage have been proposed, see Krugman (1983) for example, much skepticism remains over choices of industry that appear to be inconsistent with the older factor-proportions doctrine. Nevertheless, the perception that industrialization, and indeed industrialization along specific lines, is necessary for national economic success clearly makes policies that bypass the implications of factor-endowments theory attractive to policymakers. Thus Japan, for example, embarked on an expansion of its steel, shipbuilding, automobile and chemical industries at the close of World War II despite the fact that its factor endowment clearly suggested that Japan's comparative advantage lay in more labor-intensive industries.[2]

*2. Selecting markets.*—In selecting the industries that are to receive government support, the characteristics of the production process are of course important. Presumably the government must seek out industries where productivity and productivity growth are high, where economies of scale will create the potential to preempt rivals from other nations, etc. However, as important are the demand side characteristics of these industries. That is, the income elasticity of new products ought to be high as should the price elasticity of market share of established products. Industries aimed at the leading edge of the product-life-cycle in advanced economies will benefit from longer lives than industries geared to older products, since, for new products, as advanced-country markets become saturated, the markets of less developed countries begin to expand.

In the case of Japan, for example, the post-War decision to promote capital-intensive industries was as much influenced by their appealing supply-side characteristics as by the realization that, at the time decisions on industrial policy were made, the United States was the only large market open to Japanese exports. Thus the Japanese predilection toward high-productivity growth sectors was reinforced by the need to serve a large, sophisticated market with high income elasticity of demand for goods produced under conditions of increasing returns to scale or by industries characterized by relatively uncompetitive price policies.

*3. Allocating resources.*—Even if the government is able to identify winners and losers, it faces the problem of reallocating resources from the latter to the former. Existing industries have a vested interest in remaining in existence and both management and labor are likely to exert strong pressure to turn industrial policy into a policy of protecting declining industries.[3] Similarly, representatives of industries viewing themselves as potential winners are likely to pressure government decisionmakers to make allocations favorable to them. Since existing industries are likely to have greater political leverage than nascent or non-existent ones, the possibilities for developing industries *ab ovo* would appear to be limited. Moreover, given the political demands of many labor and management advocates from different sectors, government may be forced to spread the access to additional capital and labor among too many industries, thus precluding the possibilities of creating economies of scale and establishing comparative advantage for these industries.

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[2] See E. O. Reischauer, "The United States and Japan" (3rd ed.) New York: Viking, 1964, and Organization for Economic Cooperation and Development, "The Industrial Policy of Japan," Paris, 1972.

[3] Robert C. Reich, "Making Industrial Policy", *Foreign Affairs* 60:4, (Spring, 1982).

*4. Achieving production and exports.*—To the extent that the government is able to direct resources toward favored sectors the possibility of a successful industrial policy exists. However actual success will depend on effective production, so that economies of scale and potential productivity gains are realized. This requires appropriate management skills as well as the ability to create the necessary technology or to master technology imported from abroad. Once produced, goods must be marketed effectively in the target countries.

Consequently it is evident that the success of an industrial policy depends on political, technical, managerial and business factors. By examining the East European experience with industrial policies, we should be able to learn something about our own likelihood of successfully implementing such policies. East European institutions are, of course, different, but as we shall see many of the problems faced by policymakers in planned economies would be likely to occur in market economies. Moreover, the proportion of output devoted to capital formation in East Europe is higher than that in most market economies. Thus the East European experience should shed some light on the role of the rate of capital formation on the success of industrial policy.

## II. INDUSTRIAL POLICY IN EAST EUROPE

If we view industrial policy as the concentration of government attention and resources on industries regarded as deserving of special support or rapid development then it is evident that East European leaders have pursued industrial policies since the end of World War II. Policymakers had very definite ideas about the restructuring of the market or quasi-market economies they inherited from previous regimes. Until at least the mid-1950's and, in several of the less developed socialist countries, until many years later, the central authorities pressed for the priority growth of heavy industry, spearheaded by metallurgy and machine-building, and for systematic import substitution both in heavy and light industry.

In the 1960's industrial policy began to achieve a greater focus, presumably as part of the shift from extensive growth to intensive growth. The German Democratic Republic was the first to propose a strategy for a "scientific revolution" in industry according to which those products that were most likely to be carriers of technological progress—chiefly products of the electronics, precision, and optical industries—would be given special priority in the allocation of investments and R+D resources. "Structure-determining tasks" that focused on these priority sectors were directed centrally, while responsibility for other, less important, products was delegated to ministries, associations (*Kombinaten*), and enterprises.[4] The idea of concentrating resources on technologically advanced products was also influential in other East European countries although the means of implementing these policies varied from country to country in keeping with the growing diversity in national economic systems.

A new conception of an industrial policy of the Japanese style, aimed at developing branches or subbranches of industry capable of generating specialized exports that would be competitive in world or CMEA markets, emerged in Eastern Europe in the second half of the 1960's. This export-oriented strategy was at least partly congruent with the notion of promoting technologically advanced products, but it assumed different forms and emphases in different countries. In this paper, we examine the industrial policies of three countries, Czechoslovakia, Hungary, and Poland. Among these three countries there are sufficient differences in industries selected for promotion, markets earmarked for penetration, and mechanisms for allocating resources to priority sectors to give this study a degree of generality, even though we do not review developments in all of East Europe.

### *A. Industrial policy in Czechoslovakia*

In Czechoslovakia, declining growth rates, the exhaustion of labor reserves and a deterioration of the international competitiveness of Czechoslovak industry made the development of an industrial strategy of critical importance, particularly after the abolition of the reforms of the late 1960s rendered any economy-wide improvement in productivity and efficiency of resource allocation unlikely. Such a strategy, if effectively implemented, would have relieved the growing labor shortage by raising labor productivity and reduced the need for increases in the proportion of output devoted to investments, many of which were being scattered among too many projects to have any appreciable effect on productivity. It was widely recognized that Czechoslovak industries were insufficiently specialized and that, as a result, economies of scale and of serial production were not being captured, and R+D efforts were being spread too thinly to maintain world standards.

The government's industrial policy was promulgated in the early 1970s in the form of directives targeting certain sectors for priority development. Because labor shortages were viewed as a serious problem, the program also earmarked a number of sectors whose output and employment were to decline. This program of "most important structural changes" (MISC) originally covered some 60 sectors and subsectors that were to be accorded priority access to capital and labor.[5]

According to Csaba (1983), the criteria employed by policymakers for choosing priority sectors were:

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[4] Granick (1967), pp. 146-7.

[5] Susta p. 10. The name accorded to the program of structural changes has varied from time to time. To avoid confusion we use "most important structural changes" throughout.

> The perspective nature of production, the state of R+D, the standard of the technical management, the material—and cooperation—intensivity of production, the size of production, and the investment needs. (p. 80)

Csaba criticizes these criteria for two reasons. First there are no marketing criteria nor any reference to the needs of the world market. This criticism has, of course, a good deal of validity; the criteria do appear to point more toward what the Czechoslovak economy could achieve rather than to what it should attempt. Nevertheless at least some of the sectors chosen appear to have had good market prospects. Csaba's second criticism is that the criteria make no reference to comparative advantage. If here Csaba means the traditional factor-endowments theory, then he is correct but off the mark, since a good industrial policy can be based on criteria other than resource endowments. However, of the non-traditional components of comparative advantage only economies of scale are mentioned explicitly. Thus, it is difficult not to share Csaba's disappointment in these criteria. They appear to seek lines of least resistance rather than of maximum export potential, lack any clear conceptual basis, and were characteristically Czech in their lack of elan.

The program to develop a nuclear energy industry was the largest and in many ways most attractive of the MISCs. Although there had been a drawn-out effort in the 1960s to construct a small nuclear powerplant based on indigenous designs and utilizing some Soviet technical assistance, the technological basis for the Czechoslovak nuclear power industry was the simpler, Soviet-designed VVER-440 reactor.[6] The Czechoslovak nuclear power program cut across ministerial lines and involved enterprises from the Ministeries of Electronics and Electrical Engineering, Metallurgy and Heavy Engineering, and Fuel and Power among others as well as participation by Czechoslovakia in a number of CMEA organizations including the Interatom Institute and the Permanent Commission for the Peaceful Utilization of Atomic Energy. This rather novel marshalling of resources from several ministries to fulfill a specific industrial objective may have been imported from the Soviet Union along with the technology for the VVER-440. During the early 1970s management specialists affiliated with the Soviet Institute for the Study of the USA were advocating the use of matrix organizations in Soviet industry. In such organizations, also popular in the West at that time, productive units are subject to dual authority. The Volga Automobile Plant and Kama River Truck Plant were organized along these lines. In the case of the Czechoslovak nuclear power industry, participating enterprises were subordinated to both their branch ministries and to the management of the nuclear-power program.

Initially Czechoslovak efforts were directed at the construction of pressure vessels, piping and turbines although eventually the scope of activity was widened. By the end of the 1970's the nuclear power program accounted for 7.5% of the industrial labor force and reports published during the 1970s claimed that some 30 percent of industrial investment was directed toward enterprises participating in the program.[7] Among the major participants in the program are the Vitkovice Iron Works in Ostrava which produce specialty steels for reactor vessels and pipes, Sigma of Olomouc which produces pumps and tubing and Skoda of Pilzen which produces the reactor vessels, heat exchangers and other machinery.

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[6] J. G. Polach, "Nuclear Energy in Czechoslovakia: A Study in Frustration" Orbis, No. 3 (1968). The Czechoslovaks originally opted for a gas-cooled heavy water reactor, the design of which is considerably more complex than that of the pressurized water reactor that serves as the basis for the Soviet and CMEA nuclear energy program.

The decision to develop a nuclear power industry would appear to be a wise one for several reasons. The program draws on traditional Czechoslovak capabilities in metallurgy, heavy engineering and power generation. The lumpiness of investments required to develop the manufacturing capacity should shut potential competitors within CMEA out of the market were CMEA cooperation agreements not sufficient to do so. Moreover, even in the early 1970s, before the energy crisis, CMEA plans for nuclear energy indicated that the demand for nuclear power stations would grow through the decade. Since then, market demand has grown, if anything, faster than the ability to meet it. Thus by 1990 Skoda hopes to have exported eleven reactors to other CMEA countries and the potential exists for exporting the VVER-440 or the newer VVER-1000 to developing countries as well. Finally, the industry not only serves an important export role but also meets a pressing domestic demand for nuclear power plants.

Other large investment programs included the expansion of facilities for the manufacture of cars and trucks as well as a number of high-technology ventures in computers, semi-conductors and integrated circuits. These not only lack the drama of the nuclear sector but are also less well thought out. The market for computers and electronics products was growing rapidly in the 1970s, owing largely to sharp decreases in prices resulting from competition spurred by economies of scale and rapid technological progress. That Czechoslovak industry had the flexibility and managerial skills to compete effectively in such a rapidly changing field seems doubtful. Similarly, it is difficult to discern any potential advantages for Czechoslovak cars or trucks in either western or CMEA markets at least in the 1970's.

In addition to these large inter-ministry programs, a number of priority sectors were identified at the sectoral ministry or association level. One such effort, successful to a great extent, was mounted in the design and production of textile machinery. This program was based on past innovation in jet looms and involved active exports of Czechoslovak machinery and licenses as well as imports of foreign technology to maintain world standards in quality and technological level.

Presumably due to difficulties in allocating resources to the priority sectors, the number of MISCs was reduced to 35 for the 1976-80 FYP and then to 31 for the 1981-85 FYP. Nuclear energy, electronics, automobile and truck manufacturing and machince-building continued to be the principal sectors earmarked for priority development. In the latter sector, recent emphasis has been on hydraulics, automation and robotics, machine tools and food and chemical process equipment. Some rationalization of the production of machine tools, by winding down the manufacture of unsophisticated products, should occur as part of the policies adopted for this sector.

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[7] It is unclear, however, whether this investment figure includes expenditures for the construction of nuclear power plants in Czechoslovakia or only the capital expenditures of enterprises producing components for the nuclear power industry.

The evident effort of Czechoslovak policymakers to concentrate their efforts on an increasingly smaller number of projects during the course of the 1970s reflects in part difficulties in managing a large number of priority sectors and in part a general trend in recentralization for political and ideological reasons. The general recentralization of decisionmaking began in 1970 when enterprise autonomy was sharply restricted and gross value of production was reintroducted as the key obligatory measure of enterprise performance.[8] These developments clearly had a negative impact on the ability and willingness of enterprises to innovate and to improve the quality of their production. Also in 1970 the government introduced a set of regulations designed to curb enterprise autonomy in the area of investments.

Enterprises were prohibited from undertaking investment projects not included in the plan and a system of central authorizations for construction activitities was instituted. These legal restraints were supplemented by financial levers; the State Bank was prohibited from financing unauthorized investments; and in 1973 the share of enterprise funds paid into the state budget was increased. Such measures should have enabled the planners to allocate capital to priority sectors without overstraining the capacity of the construction industry or exceeding the planned level of investment. Unfortunately, the FYP for 1971–75 was approved prior to the final approval of the 1971–75 MISC program. Since the FYP had already allocated available investment resources and no system of priorities had been established for diverting investment to the MISC program, a competition between planned investment projects and the MISC program developed. The resulting excess demand for investment resources turned what had been a relatively modest and consistent FYP into one where actual investment exceeded the plan by 20% and where the proportion of output to investment reached historic highs. Under such circumstances neither the investment plans of the ministries nor those of the priority sectors could be fully realized, and the backlog of construction projects awaiting completion increased.

For the 1976–80 FYP the planners included the MISC investments directly into the plan, but in general left the implementation of industrial policy to the branch ministries. While this should have, in theory, reduced the competition for investments and worked down the backlog of uncompleted projects in practice the experience of the previous FYP was repeated. In part this was due to the fact that the proportion of output devoted to capital formation was maintained at the level achieved during the previous FYP, generating investments well beyond the absorptive capacity of the economy. Beyond this error in macroeconomic policy, the existing system of management led the ministries to subvert the

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[8] See Levick (1981) for a description of the changes in the management system.

MISC program. The priorities granted to MISC projects were slight and given the continued emphasis on gross output as the primary indicator of enterprise performance, enterprises, supported by their ministeries, must have diverted resources toward efforts to meet current output plans at the expense of structural changes. Needless to say, no divestment of production was evident under these conditions.

In view of Czechoslovakia's tight labor market, the authorities also had to consider ways of shifting labor to enterprises in the MISC program. To make such shifts attractive, a system of recruitment allowances payable to workers joining MISC Enterprises was introduced. While these allowances vary among industries, Altmann (1982) reports that the maximum recruitment allowance is 6 months' gross wages for workers signing a 5-year employment contract. On the basis of these bonuses it was expected that enterprises that were part of MISCs, employing some 15 percent of all industrial workers, would attract 42 percent of the entrants into the labor force during the FYP. Additional workers were to come from enterprises whose production was to decrease as part of the industrial policy. These reductions in production were to free up some 32, 000 workers during the course of the FYP. Altman (1982, p. 86) indicates that as of 1977 only some 6,600 jobs had been eliminated, in large part because the emphasis on gross output targets induced managers to maintain output and employment at the highest possible level, a practice supported by their branch ministries. Given strong worker preferences for specific work locations and the difficulty of moving, the recruitment bonuses do not appear to have been sufficient to create the type of labor mobility required if enterprises in the MISC's were to attract sufficient supplies of labor. Even the nuclear power industry, in many ways the flagship of the MISC program, appears to be suffering from labor shortages. Construction of nuclear powerplants is well behind schedule at Jaslovske Bohunice and at Dukovany where the number of workers is only half of that required.[9]

On the positive side of the ledger, it is evident that Czechoslovakia has developed an industrial policy that remained relatively consistent for the decade of the 1970s and that is being carried forward into the 1980s. Moreover, judging from Czechoslovak commentaries and general foreign trade policies, it is evident that Czechoslovak leaders have chosen an industrial policy oriented primarily toward the CMEA market rather than toward markets in developed market economies. While both the criteria for choosing potential "winners" among industries and the choice of a target market are open to criticism, the greatest weakness in Czechoslovak industrial policy is in its implementation. On the macro-economic level one cannot escape the feeling that during the 1970s the investment needs of industrial policy were simply added on to the normal level of investment. No curtailment of investments in non-priority branches took place. MISC programs were weak. At the micro-level, the recentralization of the economic system created incentives that hindered efforts to restructure. In the last analysis industrial policy must include both destruction and creation of productive units; it cannot simply be an addition to existing investment programs.

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[9] See Rude Pravo, June 14, 1983, for a discussion of construction lags in nuclear energy.

### B. Industrial policy in Poland

Although Polish efforts to formulate an industrial policy antedate Czechoslovak efforts by several years, they stem from the same concerns with poor export performance of industry, lagging growth rates and low labor productivity. The Eleventh Plenum of the Polish United Workers' Party's Central Committee met in March, 1968 to consider these problems.

Wladyslaw Gomulka, the First Party Secretary and highest power in the land, gave the keynote speech. The first point made by the Party leader was that foreign trade was a "determining factor" in the growth of the Polish economy. Since the volume and profitability of foreign trade were dependent on the level of development of the country's industry, "the plan for the reconstruction of our industry should be primarily oriented toward the maximum growth of the most profitable export." However imprecise this criterion for directing investments, the thrust of the recommendation was clear. "Smaller countries, even the more developed among them, must specialize their production." They must have a "specialized export industry, all the more so if they are less developed." Poland with its population of just over 35 million and its medium level of devleopment (lagging behind the German Democratic Republic and Czechoslovakia, not to speak of the industrially advanced countries of Western Europe) clearly belongs to the group of economies that cannot afford not to have specialized export industries. Nevertheless, Poland's investment strategy, Gomulka observed, had been oriented toward the all-around development of industry and the advancement of its technological level rather than concentrating resources on specialized establishments capable of mass-producing goods for export.

The Politbureau of the Party's Central Committee simultaneously published a report on foreign trade problems that translated the First Secretary's Speech into concrete directives (Politbureau, 1968, 27–44). To lay the ground for a program of specialized, profitable machine-building and manufactured consumer goods exports, the Politbureau recommended:

1. that certain branches of industry be designated whose rates of growth will dominate the rest and form the basis for Poland's export specialization. Specialization should be geared to the profitability of acquiring foreign currencies and to the prospects of finding favorable outlets abroad for the products of these industries.
2. that certain enterprises be singled out in the machine-building, furniture, garment, and other industries for specialization in export. Such enterprises should produce goods for export in long series and constitute the specialized core of the designated branches of industry under point 1.
3. that every enterprise should exploit to the maximum every opportunity for exporting any products whatsoever so long as it could do so profitably.

To carry out these recommendations, investments funds were to be earmarked for expenditure in the last few years of the current five-year plan (1966–1970) and during the next plan spanning the years 1971 to 1975. Moreover, enterprises specialized in exports "should enjoy certain facilities":

1. the banking system must facilitate their obtention of credit (additional to the budget grants that would continue to be made available to finance large projects).
2. they should have priority in the utilization of foreign exchange funds at the disposal of their ministry.
3. they should also be granted short-term credits in foreign currencies to finance above-plan imports, which they could repay from above-plan exports. Associations and ministries should help these specialized enterprises develop a sound technological base and assist them in recruiting and training cadres.

## PUBLIC DISCUSSION OF THE NEW STRATEGY

In the months that followed the Plenum, a frank discussion took place in Polish periodicals over alternative ways of carrying out the Party's directives on export expansion and specialization.

Three main strategies emerged, which were promptly dubbed "minimalist," "maximalist," and "compromise" (Najnigier and Tarchalski, 1968, 14–18). The proponents of the "minimalist" approach pressed for the further development of industries that, as a consequence of their long experience and of the relatively high level of production they had achieved, were capable of producing goods at a low per-unit cost. These branches of industry included shipbuilding, railroad vehicles, construction and road-building machinery and textiles produced from traditional (natural) raw materials.

The "maximalists" asserted that it was necessary to force the development of branches of industry with relatively high value added with a low material-inputs content (goods with a high imported-materials content were especially to be avoided). Among the branches of industry satisfying this criterion were electronics (with priority for technologically advanced subbranches such as laser technology), atomic products (isotopes, plasma technology), high-value chemicals, some means of transportation including automobiles, a few types of ships, and helicopters, and a textile industry based on synthetic materials. This strategy, closely related to the GDR's emphasis on structure-determining products, was expected to generate growth in part through the forward and backward linkages that would induce other branches of industry to accelerate their technical progress and generally contribute to an increase in the economy's "social productivity." A characteristic trait of the proponents of the "maximalist" position was their inclination to emulate the industrial structure of more advanced countries (the U.S. and Japan among capitalist, the G.D.R. among socialist nations) and their disinclination to rely on "static" efficiency criteria.

Economists in favor of the "compromise" position urged that Poland concentrate its investments and other development resources on export products facing a rapidly rising demand or at least "a stable large volume of demand." This view represented a compromise between the "minimalist" and the "maximalist" position in the sense that products characterized by an income-elastic world demand were generally technologically advanced, while, on the other hand, among those for which there was a large and steady volume of demand, there were a number of traditional Polish exports. Critics of this approach objected that the criterion was ambiguous and that, in any case, the possibilities of forecasting world demand for Polish products were limited due to "long neglect" in the systematic study of foreign markets.

Just before the deadline of September 1968 set by the Party in its April directives, a list of seventeen branches of the heavy and machine-building industries slated for specialization in export production was published in the *Journal of the Ministry of Foreign Trade* (W. Gorski, 1968, 335–36). These were:

1. Ships and shipping equipment;
2. Railroad vehicles;
3. Paper-making machinery;
4. Pumps and Compressors;
5. Industrial "armature" (valves, nozzles, etc.);
6. Ship motors;
7. Machines and equipment for the metallurgical industry;
8. Complete installations including machines and equipment for the chemical, sugar-refining, electric-power generating, and metal-casting industries and for the protection of plywood;
9. Motor vehicle equipment;
10. Lathes;
11. Textile Machinery;
12. Construction and road-building machinery;
13. Internal combustion engines;
14. Electrical machinery and equipment;
15. Machine tools;
16. Office machines and peripheral equipment for computers;
17. Control and measuring equipment.

It might well appear, the author of this progress report observed wryly, as if virtually all the branches of the two ministries had been earmarked for specialization. In fact the share of these branches represented 60 percent of the total output of the Ministry of Heavy Industry and 65 percent of the Ministry of Machine Building. The rate of growth of exports of the 17 branches in this early variant of the plan for the years 1971 to 1975 was 19.7 percent per year in the first ministry (21 percent to capitalist countries) and 7.7 percent in the second (15.5 percent to capitalist countries). This was "inadequate," the writer commented, considering that the average rate of exports planned for the ministry of Machine-building as a whole was 14 percent (20 percent to capitalist countries). We can hardly quarrel with his suggestion that the rate of growth of exports of industries specializing in export production should at least exceed the average.

The failure of the government to pursue a strong line in carrying out the specialization strategy—too many branches and too many establishments had been designated—was in large measure a consequence of the generous privileges that it had granted to specialized exporters. There was a scramble to get on the lists and vigorous bargaining on the part of the enterprises and establishments that had not initially been included. Decisions on the allocation of investment funds for the five-year plan were to take into account a three-way classification of industrial enterprises. Priority was to be given to the first groups consisting of enterprises that were slated to grow very rapidly; the second group, granted a lower order of priority, was made up of enterprises that were supposed to grow less rapidly than during the current five-year plan (1966–1970); enterprises belonging to the third group were not to grow at all. This classification, carried out by the associations to which the enterprises were subordinated, placed 70 percent of all industrial enterprises in the first category responsible for almost exactly two thirds of gross industrial output. Just over 82 percent of all investments were earmarked for this group. The other enterprises were to divide up the rest of the investments in some unspecified way. Too many enterprises, the critics objected, had been placed in group 1 to ensure the necessary concentration of investments in those enterprises with a decisive importance for the modernization of the economy. There was a significant difference in the classification of enterprises in the Ministries of Machine-Building and Light Industry. In the former, enterprises representing 84.3 percent of gross output were placed in group 1 while only 1.2 percent of output came from enterprises placed in group 3. In light industry, enterprises representing 37 percent of the value of the fixed capital in the industry were allotted 81.5 percent of all investments. These figures are not altogether comparable, but they do suggest a greater concentration of investments in light industry, presumably on enterprises earmarked for above-average growth. The ability of the associations in light industry to impose an "unevenhanded" investment program on their enterprises may be a reflection of the relative lack of bargaining power of the latter, at least compared to enterprises in the machine-building industry. Enterprises engaged in machine-building, for over two decades a highest-priority sector, were apparently better able to defend themselves against cuts in allocations.

According to a subsequent report (Gruzewski, 1972, 132), the government chose not to ratify the proposed designation of selected branches of industry as "specialized in export." Neither export-specialized branches nor enterprises were ever instituted.

The evidence regarding the slack fulfillment of the Party's directives on export specialization must also be viewed in the context of the political changes that intervened two and a half years after the eleventh plenum. In December 1970 the Gomulka government attempted to raise the prices of meat and other staples with a view to reducing subsidies, bridging a widening inflationary gap, and releasing foodstuffs for export. The price increases touched off strikes and civil disorders. In January 1971 Gomulka was compelled to resign his post as General Secretary of the Party. Edward Gierek was named to head the Party in his place. The policies of Gomulka's chief economic aide Boleslaw Jaszczuk came in for specal criticism. While the strategy of export specialization was not explicitly repudiated, the vested interests that it had threatened among industrial ministries and enterprises took advantage of the new political situation to further undermine the "selective development" policy introduced in 1968.

The industrial policy of the Gierek administration cannot be understood in isolation from the economic ideas that it propagated. At the heart of the Gierek ideology was the mutual interdependence of per capita consumption and labor productivity. It had always been an accepted fact that per capita consumption could not be raised unless labor productivity increased; but it was now emphasized that, in order to raise productivity, it was also necessary to boost real wages and make more consumption goods available to households. In the long run of course gains in productivity also depended on the introduction of modern equipment. Thus, it was argued, rapid growth in productivity necessitated both a high rate of investment and sizable increases in real wages. The Gierek team of economists thought that the way to resolve this dilemma was to launch a dynamic foreign trade policy: to borrow heavily from the West (which Gomulka had been reluctant to do), to buy high-technology licenses on an unprecedented scale, to enter into coproduction agreements with foreign firms, and to stimulate both imports and exports (Fallenbuchl, 1977, 830: Ryc, 1972, 102-3).

Close analysis reveals that the "overture to trade" was not entirely congruent with the industrial policy inaugurated in 1968, as one might have expected it to be. Since the importation on credit of new technology was expected to ease the strain on available foreign exchange, there seemed to be less urgency to concentrate investment resources on a few branches of industry specialized in export production. In fact, when Gierek's new policy met with apparent success in the period of 1972 to 1974—high rates of growth of net material product and unprecedented increases in real wages were achieved in conjunction with a much improved export performance, an extraordinary inflow of foreign credits, and a large number of new agreements for the importation of high-tech licenses—it seemed even less urgent to make painful choices in allocating scarce resources. Polish industry was becoming rapidly modernized. Yet it seemed as if the country was incurring no sacrifice, bearing no burden that could not be put off until a later time when it could be borne more easily. As it turned out, western technologies were not absorbed as quickly as had been anticipated, and Western markets, in part because of the 1974-75 recession, did not sop up Polish manufactures on anything like the scale that had been contemplated, so that the great hopes of the first half of the seventies were largely disappointed. This does not mean, however, given the prior expectations the planners had at the time about market prospects in the West, that the gambles they took were necessarily bad. To form a judgment on this issue, we need to delve in more detail into the circumstances that affected Poland's export specialization policy in the early 1970s.

Criticism of Gomulka's policy of selected development, while fairly muted, was still clearly perceptible in the first years of Gierek's role. The crux of it was that there had been an overemphasis on generating efficient, low-cost exports while the problems of providing industry with adequate inputs—whether imported or potential exports—had been neglected. Exports of many commodities had been curbed because of their "low profitability," even though "this forced us to limit the import of valuable raw materials and consumer goods of high market value" (Polska Zjednoczona Partia Robotnicza, Komitet Centralny, 1971, 8-9). This suggests that it was not that the policy of export specialization was wrong in itself, but that it should not have been carried out at the expense of "domestic needs."

What were these "needs"? Some of them originated in the demand for high-quality materials and equipment on the part of civilian industries. But it would be naive to overlook the potential role of the military in obstructing the policy of "selective development." It must be kept in mind that the machine-building industry, which was the first candidate for developing specialized branches for export, was at the very core of the military-industrial complex. The Ministry of Machine Building fulfilled the role of central coordinator for all other ministries with respect to major weapon systems (Checinski, 1981, 37). A Military Group in the Planning Commission supervised the planning and development of branches of the machine-building industry that had both military and civilian uses (Sitek cited in Checinski, 1981, 36). Would the decision makers representing Poland's military interests have been satisfied with a new order or priorities which would have directed some of the country's scarcest resources to export industries? Evidently, the military-industrial complex, no matter what assurances it received that its "needs" would be respected, could not but be concerned by the long-run negative impact of the export-specialization policy on its interests. It was politically prudent for Gierek when he was consolidating his power to conciliate the Polish military establishment with its well-known links to Moscow. It was then expedient for him to ignore or modify the 1968–69 policy so as to mitigate its adverse effects on the military's entrenched interests. This could most easily be achieved by lowering the priority status of export-oriented industries. It soon became apparent also that, for the foreseeable future, specialization would have to be confined to branches with a tested track record and that the hopes of creating brand-new industries with an export potential would have to be postponed at least to the 1980s (Madej, 1972, 125). The "minimalists," to revert to the language of 1968, had gained the upper hand.[10]

The systemic reforms introduced by the Gierek administration placed the problem of export specialization in a new light. At the time the authorities had embarked on an export-specialization policy at the end of the 1960s, decisions as to what branches of industry and what enterprises would specialize in which product lines had been made "from above" by the ministries and their subordinate associations.[11] Neither the ministries nor their associations had direct ties with foreign markets since foreign trade decisions were centralized in the Ministry of Foreign Trade and its specialized Foreign Trade Enterprises which had exclusive responsibility for buying products for export from producing enterprises and selling imported goods on the domestic market. Specialization decisions relied on very limited information, mostly obtained from the Ministry of Foreign Trade, about supply and demand trends on world markets, along with information regarding agreements and contracts that Poland had entered into with CMEA partners. Foreign-trade efficiency calculations were based on comparisons of foreign prices with domestic production costs which rested in the last analysis on administered prices that only dimly reflected Poland's opportunity costs on foreign markets. Gierek's administration recognized these short-comings, and proceeded cautiously to remedy them.[12] While maintaining centralized control over producer prices, it attempted to bring them more closely in line with foreign opportunity costs, especially for widely traded raw materials and semifinished products that were of decisive importance in Poland's foreign trade. More important still (since administered prices remained fixed for years at a time and could not reflect the rapid price changes that were taking place in world markets in 1970s), enterprises were credited with the value added of their export production in terms of "prices of realization," i.e. prices in foreign currency at the official exchange rate multiplied by fixed coefficients (Fallenbuchl, 1977, 844). Thus when an enterprise obtained higher prices abroad for its exports, whether due to price changes on the world market or to improvements in the quality of its products, its "value added," to which average wages were tied, also increased.

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[10] Zbigniew Madej, the future head of the Planning Commission, advocated a specialization strategy consisting in a gradual transition from the "beaten track" (essentially the "minimalist" stance of reliance on industries in which Poland had gained experience and that could produce exports at lower per unit cost) to "squeezing into the interstices," by which he meant specialization in products whose markets had not been preempted by other major exporters.

[11] The associations when they had been founded at the end of the 1950s were supposed to represent the economic-financial interests of their constituent enterprises, but they were quickly transformed into a hierarchic link, in all but name identical with the old central administrations or bureaus, betwen industrial ministries and their subordinate enterprises.

On the import side, similarly, higher foreign prices were supposed to translate into higher costs—although in practice subsidies were used lavishly to spare producers from the full impact of price increases. The Gierek administration sought also to put an end to the isolation of producers from their actual or potential suppliers and clients abroad by integrating Foreign Trade Enterprises in the industrial associations corresponding to their product range (Wraszczyk, 1974, 72). A number of associations and newly created Large Economic Units (WOG's), consisting of important multi-establishment enterprises together with their satellite plants, were allowed to keep a portion of their foreign-exchange proceeds for their import needs. The general principle was established that each association, as far as possible, should pay for its imports from its exports proceeds. While some of these reforms were gradually withdrawn as the economic crisis of the second half of the 1970s unraveled, there is little doubt that, for a few years, they did help narrow the gap between producing establishments and Foreign Trade Enterprises and helped to expose Polish industry to world market conditions somewhat more than in the past (Jung, 1975, 12).

Alongside the rather esoteric criticism of the policies of the previous administration, the discussion regarding Poland's optimal specialization continued, especially in connection with the machine-building industry with its characteristically wide range of products and correspondingly disparate prospects for successful marketing in domestic and foreign markets. One theme recurred again and again: domestic industries were generally eager to introduce new machines for export or for domestic consumption, but none of them offered to trim back, let alone eliminate, established products that might be replaced by cheaper imports. As in the past, investment resources were scattered over too many product lines. Owing to this saupoudrage, production costs remained high, which in turn cut down on the supply of exportables. An endemic shortage of foreign exchange prompted producers to manufacture substitutes for imported machines "at any cost." In preparing the five-year plans for 1971-75—which still had not been approved at the end of 1971—the question was asked, what types of equipment Poland ought definitely not to produce. The answer received (apparently from machine-building enterprises and employees of the Ministry of Machine Building) was that Poland should not plan on producing passenger ships, supersonic jet planes, equipment for nuclear plants, and "similar items," evidently of a high-tech nature and requiring massive investments beyond Poland's means (Gwiazdzinski, 1971, 404). That the associations and enterprises had this virtually unsatiable appetite does not mean, as we have seen, that higher authorities were willing to accommodate them. But it does show where their aspirations lay, and the resistance to any move from the top down to trim an excessively wide gamut of products might encounter.

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[12] On the strategy of reforms in foreign trade as they were envisaged at the beginning of Gierek's rule, see Burakiewicz, 1971, 65–68.

As in the case of Czechoslovakia, there are serious weaknesses in the implementation of industrial policies in Poland. In part, the weaknesses stem from similar causes, among them the unwillingness or inability of central authorities to deny resources to entrenched ministry and enterprise interests, the lack of adequate incentives to promote efficiency and innovation and general macroeconomic disequilibrium. In contrast to the lack of strong incentives for participating in the MISCs apparent in Czechoslovak experience, Poland appears to have had excessive incentives for enterprise participation and a faulty or ineffective means of screening out those enterprises unlikely to be successful. There was also less consistency in industrial policy: Polish criteria for choosing priority sectors were unsettled and changed over time. The most striking difference between Czechoslovak and Polish industrial policies, however, was that Czechoslovakia's choice of sectors appeared to have been made with reference to the needs of the CMEA market while, at least in the 1970's, Polish industrial policy was being framed with view toward developing the capacity to export to western markets. Despite these differences, Poland's choices of industries to develop overlaps the Czechoslovak list in a number of categories including cars, machinery and electronics. Whether Poland was more or less successful in attaining the objectives of its industrial policy will be examined in the empirical section of this paper.

### *C. Industrial policy in Hungary*

In Hungary, as in the other socialist countries, the 1950s were devoted to the creation of an industrial base with particular emphasis on metallurgy and machine building. Even in this early period of general industrialization a number of projects designed to create large-scale export-oriented production were undertaken, largely on the potential of the CMEA or, more specifically, the Soviet market to provide a large and growing demand for Hungarian products. Among the priority products were diesel engines, motor vehicles, machine tools, telecommunications equipment and machinery for the food industry. According to Schweitzer (1980) these efforts were, to a greater or lesser extent, unsuccessful.

The high degree of vertical integration of Hungarian enterprises forced each to attempt to produce all the necessary components rather than relying on sub-contractors or on imports. As a result neither economies of scale nor high quality could be obtained in component production. On the basis of the import capacity of the CMEA and particularly of the Soviet market, extremely large production facilities were planned, straining both the capacity of the Hungarian enterprises to construct the necessary facilities and their ability to design and test their products to ensure that they met minimal standards of serviceability and quality. Schweitzer attributes this inability of the enterprises to implement these priority projects to the fact that the conception of these projects came "from above" and was based on inadequate knowledge of enterprise abilities.

Despite continuing difficulties with these projects during the 1960s most of them survived in one form or another. This may in part be due to the shift in policymakers' interest from industrial policy to economic reform that culminated in the introduction of the New Economic Mechanism in 1968. Given the uniqueness of NEM measures and the systemic barriers to an effective industrial policy evident in the Czechoslovak and Polish cases, it is worthwhile to examine NEM features relevant to industrial policy. The allocation of investment was to be decentralized, with the state retaining control over one-half of investment resources and enterprises over the other half. Enterprises were to be given greater decisionmakng powers over production as well, with profits and market prices guiding output and input choices. Output targets were abolished and branch ministries were to seek economic outcomes rather than to plan in detail the activities of subordinate enterprises. Finally a functional exchange rate would provide links between producers and foreign markets creating both competition from imports and a stimulus for export-oriented production.

Along with the NEM came new instruments for promoting industrial strategy. To provide capital for the development of priority sectors central capital allocations were consolidated into so-called Central Development Programs (CDPs). CDPs reflect the recognition that:

> . . . in order to accomplish major changes in the production and utilization structure of the national economy, development programs requiring large investments are also needed whose selection and financing cannot be subject to decisions influenced by current market demand and market conditions—considerations related to enterprise profit interests. (A. Balassa, 1975, p. 91).

The authorities could also make use of a system of credit policies and explicit and implicit subsidies to steer investments of enterprises toward priority sectors.

Six CDPs were to be started during 1971–75. They included a scheme for expanding natural gas utilization; the development of the petrochemical, aluminum and motor vehicle industries; the promotion of computer production and utilization; and the use of light-weight structures in construction. Balassa lists some of the objectives of these CDPs from which we can gain some insight into the criteria employed by Hungarian planners in choosing priority sectors. The expansion of the production of natural gas and aluminum was based on the availability of natural resources as well as on the expectation that some down-stream technological improvements could be fostered by these two industries. Petrochemicals, computers and motor vehicles were also expected to foster technological progress, not only within their respective industries but in supplying and consuming sectors as well. All projects, of course, anticipated rapid increases in production. On the foreign trade front, the criteria were unequivocal; road vehicles were to be directed to socialist countries "to earn foreign exchange"; aluminum, petrochemicals and computers were destined for CMEA markets under cooperation agreements; and the computer program was to "accomplish the substitution of domestic products for imports from capitalist countries". Exports by any of these industries to capitalist countries were viewed as a minor consequence. The objectives of industrial policy in the early 1970s were then to promote sectors that would provide technological spillovers to the rest of the economy and would meet a large and dynamic demand on the CMEA market.

In view of Hungary's deteriorating terms of trade and acute need for convertible currency earnings in the 1970's, neither the vague, excessively inward-looking supply-side criteria nor the orientation to the demands of the CMEA market could serve as a continuing basis for Hungarian industrial policy. In October of 1977 the Central Committee of the Hungarian Socialist Workers' Party met to discuss the need to reorient industrial policy. Calling attention to Hungary's worsened terms of trade, the increasing difficulty in exporting even to CMEA markets and the slow pace of adaptation of Hungarian production, the Committee's Secretary called for the strengthening of industrial policies (Nemeth, 1977). Products to be promoted should be of high quality, up-to-date, profitable to produce and involve a high degree of processing. The ability of the economy to allocate resources to these priority sectors would be limited by ". . . the relative scarcities of labour, of resources for accumulation and of foreign exchange." (p. 242). The low growth rate of output, deteriorating terms of trade and the need to maintain consumption levels and to increase investments in energy made investment resources particularly tight. Nemeth identified energy production and utilization, the engineering industry, light industry and agriculture as sectors that met the criteria for priority development. The engineering industry was seen as vital to the ". . . long term development of the Hungarian economy, as well . . . as the intensification of socialist economic integration and of the . . . expansion of exports to the dollar area." Within engineering, the existing range of products was "too broad" and of "mediocre technical standards". Resources were to be focussed on road vehicles, agricultural machinery, machine tools, precision engineering, telecommunications and the vacuum technical industry. Nemeth recognized that this concentration of resources would require eliminating certain engineering products but cautioned this should be done only on the basis of "permanent and secure imports". In light industry, the strategy was to replace low-quality production with higher-quality, more sophisticated products thus shifting the pattern of production to more profitable items.

The Central Committee issued a set of directives on industrial policy that established scale of production, standards of technology, management and organization, market and trade positions and "production background" as criteria for selecting favored sectors. In addition greater attention was directed toward specialization, higher standards for products and management, domestic and foreign demand and the availability of infrastructure and manpower. To further emphasize the reorientation of market choice in industrial policy a fund of 45 billion forints was established to finance investments that would expand exports to the West.

Hungarian economists have engaged in a lively debate over the merits of the existing industrial policy and its results. Among the aspects most frequently critized are the following.

*Criteria for choosing priority sectors.*—Although economies of scale are used as a criterion for selecting priority sectors, such economies are often not obtained in practice (Roman, 1978). In large part this occurs because it is assumed that economies of scale are to be reaped in the assembly stage. While some economies do exist at this stage, there are also large economies of scale to be had in the production of components, sub-assemblies and parts. This production in Hungary is not undertaken on a large scale by independent sub-contractors but rather by the enterprise responsible for assembly. Thus the production of these parts is usually carried out at a volume that either fails to capture economies of scale or actually suffers from diseconomies of scale. As a result, benefits of mass production at the assembly stage are offset by high-priced and inferior components.

The stress on economies of scale may lead to the development of industries that rely on low-wage unskilled labor for their market advantage; in such industries Hungary is likely to lose comparative advantage to developing countries (Koves, 1978, p. 112). Koves also critizes the criterion of "modernity" or technological advance, arguing that "we may have to consider as an important task to manufacture such products which otherwise do not fit at all into our ideas about a modern product pattern" but that are salable on world markets due to "their good quality, flexible adjustment to individual demands, and fast delivery." While Koves' point is well taken, it is difficult to believe that quality, flexibility and fast delivery were likely competitive strongpoints of the Hungarian economy in 1978, or that they would prove to be less elusive than economies of scale.

Finally the criteria have been criticized because they lack a specific cost-benefit accounting (Roman, 1978). There are no explicit considerations of the inputs needed to implement industrial policy. In particular, the R+D expenditures, foreign licenses, and imports of components and parts required by priority projects do not appear to weigh heavily in determining development strategies. Evidently in this regard little progress has been made since the 1950s.

*Criteria for selecting markets.*—As mentioned above, Hungarian industrial policy has been reoriented toward import substitution and the needs of the CMEA market. As a consequence Hungary has developed a "dual economy". The CDPs rely on western technology and equipment to develop large-scale production of goods saleable only on the CMEA market. The production technology is not advanced enough and the products of insufficient quality to permit exports to the West. To the extent that the technology is not updated, eventually these products lose their appeal on the CMEA market as well (Koves, 1978). At the same time a more traditional and less well-supported sector that does not rely on western technology and equipment exports resource-intensive commodities to western countries (Kadar, 1978).

The orientation of industrial policy to the CMEA market is also believed to be responsible for the failure to stress efficiency, quality, high technical standards and responsiveness in Hungarian export production (Roman, 1978, p. 3). Moreover the CMEA market absorbs large quantities of goods that are reaching the mature or declining stages of their product-life cycle in western markets. Thus to capture economies of scale in production Hungary must adopt products that are unlikely to face a dynamic demand in the West.

While there may be some truth to these arguments, in large part they appear to be self-serving. True, the CMEA market does not demand the latest goods with the highest quality. However, neither does it reject such products, and one can certainly find evidence that goods of high quality and embodying new technology will fare well in CMEA trade. That the CMEA market does not demand such quality is not the cause of its absence from Hungary's exports. The true causes of the lack of quality must be sought elsewhere, particularly in Hungary's economic system.

*The economic system as a barrier to industrial policy.*—Although under the NEM one half of the investment funds are centrally controlled and the other half decentralized among the enterprises, decisionmaking over investment is viewed as being excessively centralized (Nemeth, 1978; Soos, 1978; A. Deak, 1978), inasmuch as enterprise funds are commingled with central funds or bank credits or subject to central policies and criteria when enterprises bargain for subsidies and favorable prices. As a consequence there are no funds available for entrepreneurial investments on the part of enterprises; the center's investment policies encompass virtually all investment resources. Once these investments have been allocated "there is not enough money left over for export-oriented development" (Roman, p. 114).

The allocation of 45 billion forints for loans to increase the production of exports to the West does little to remedy this since the amount is less than 10 percent of total investment. Moreover, the great demand for these funds means that firms offer to repay loans in 3 or 4 years, hardly enough time to make significant structural changes. Certainly if industrial policy is intended to go beyond the "narrow" concepts of enterprise profits and market fluctuations then this fund would seem to do little to further industrial policies. Nevertheless Kadar (1980) argues that "it was not so much the central development programmes as the export-developing credit policy of the National Bank of Hungary that encouraged the expansion of Hungarian export capacities and their structural improvement."

The large size of Hungarian enterprises has resulted in a concentration in industry that reduces the decentralization inherent in the NEM. Often preferences for a particular sector or product become preferences for a single enterprise that has no competitors within Hungary (A. Deak, 1978). Moreover, while branch ministries were to concern themselves with economic results rather than control over enterprise activities, when such results depend on the activities of one or a few enterprises, stimulating economic results and direction of day-to-day activities become difficult to distinguish. To remedy these problems, Nyers and Tardos (1978, p. 41) suggest that enterprises be reorganized in a way reminiscent of Japanese keiretsu (which include a bank and a trading company in addition to industrial plants) for purposes of investment allocation and enterprise guidance. Whether such a scheme would merely exacerbate the problems created by existing trusts (Keverai, 1980) is unclear.

Finally, it is evident that the system lacks the incentives required to induce enterprises to produce quality goods that can compete on international markets. In this, of course, Hungary is not unique. While the new wave of reforms may deal with some of the systemic barriers to industrial policy, it is unlikely to solve them all.

## III. EMPIRICAL EVIDENCE ON INDUSTRIAL POLICY

An effective industrial policy should manifest itself in at least three ways. First, priority sectors should enjoy above-average growth rates of inputs due to their privileged access to capital and labor. Second, production in the priority sectors ought to increase more rapidly than average. Finally, there ought to be a reasonably high correlation between the rate of growth of output in a sector and the rate of growth of its exports. Unfortunately, it is not always possible to gauge the success or failure of an East European industrial policy on the basis of existing data. To the extent that industrial policy is aimed at specific products, e.g., cars, poultry-processing equipment, etc., data on investment, production and exports is difficult to obtain. The East European countries' level of aggregation of the available data requires that, for long-term analysis, some precision be sacrificed.

### *A. Investment*

For Poland, data for investment at the three digit level was available, but only for 1970–72, the first three years of the new policy of "selected development". Table 1 presents the data on the concentration of investments in various sectors of Polish industry.[13] Even though the data in Table 1 covers only three successive years, we should expect that, if an industrial policy based on the principles announced in 1968–69 had actually been carried out,

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[13] The H-H index is given by:

$$HH = \sum_{i=1}^{n} (X_i/X)^2$$

where X = investment in the industry, $X_i$ = investment in the i-th sector of the industry. The greater the concentration of investment in one sector, the closer the index is to 1.

they should reveal any increasing concentration of investments on the branches of industry slated for especially rapid growth that might have taken place. For industry as a whole, the Herfindahl-Hirschman index of concentration failed to reveal any increase in concentration. Some increase in concentration apparently occurred in the metallurgy, chemicals, minerals, light, and food industries. None occurred in mining and fuels or in machine-building and metals, the largest single industry. There was a perceptible decline in investment concentration in the wood and paper industry and in the residual category of "other industry". Among the industries in which an increase in concentration took place, only the pattern of investments in chemicals appears to have been related to export specialization (plastics and artificial fibers recieved a disproportionate share of investment funds and registered above-average gains in exports from 1970 to 1978). In metallurgy, the stress was on the expansion of steel; in minerals, on cement; in the food industry, on meat-processing. None of these industries did especially well in expanding exports in the 1970s. The investments they received were geared more to meeting domestic than foreign demand.

*B. Output*

Table 2 reports the H–H indexes for the concentration of the gross value of output at current prices for four machinery and metal groups and for chemicals in Poland. There are no statistical tests to compute the significance of year-to-year differences in H–H indexes. The differences in Table 2 are small. Only the decrease in the index for the precision industries from 1975 to 1980 and the increases in the indexes for the electrical and electronic industries (from 1970 to 1975) and for means of transportation (1970 to 1980) appear large enough to be significant. (The rise in the index for means of transportation coincides with the greater-than-average growth of the automobile industry.)

Table 3 undertakes a similar calculation of output concentration for Czechoslovakia. However, instead of the H–H Index. Table 3 reports the standard deviation of branch shares of sectoral output.[14] The standard deviation of sectoral shares fell in ferrous metallurgy, non-ferrous metallurgy, paper and cellulose products, glass, leather and footwear, indicating less rather than more specialization within those sectors over the sample period. Only in the chemical and rubber, building materials, woodworking, printing and "other" sectors is there any evidence of growing sectoral specialization. On the other hand, the standard deviation of the 16 sectors' shares in industrial output increased, suggesting that there was growing specialization among, but not within, sectors.

$$\mathrm{SD}=\left[\sum_{i=1}^{n}\left(\frac{X_i}{X}-\frac{1}{n}\right)^2\right]^{\frac{1}{2}}$$

These results indicate that neither in Czechoslovakia nor in Poland did industrial policies succeed in fostering intra-sectoral specialization in production. The anecdotal evidence presented in the previous section suggests that the lack of evidence for such specialization is due to the scattering of investments associated with excessive equalitarianism in the allocation of investments among enterprises.

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[14] The standard deviation is calculated as:
where X and $X_i$ are sectoral and branch outputs respectively and in the number of branches.

### *C. Trade*

One of the difficulties with examining measures of concentration is that they are only valid if relatively large branches are being singled out for promotion. If, for example, the objective of industrial policy is to develop a new line of activity, then the concentration ratio in that industry will at first fall, as the shares of the developed branches fall and that of the new branch rises. Consequently to measure the effects of industrial policy on trade we employ a methodology that links the growth of production with the growth of imports and exports.[15]

Table 4 indicates the output-export and output-import growth vectors for selected Hungarian industries. Time spans used for calculating the growth rates cover 1960-70, the pre-industrial policy period, 1970-75 and 1970-75 periods when industrial policies were being implemented. Output and trade data are measured in physical units. Thus there is no need to adjust for price changes, but, of course, changes in size, quality, etc. are per force ignored.

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[15] This is done by calulating the cosine of $\alpha$, the angle between the vector of growth rates of production of the branches of a sector and the growth rates of the exports (or imports) of branch outputs. Figure 1 illustrates the method for a sector that has 2 branches, $X_1$ and $X_2$. The output vector plots the growth of production of $X_1$ and $X_2$. The export vector plots the growth of exports (or imports) of $X_1$ and $X_2$. If the output and export growth rates for the branches of the sector are similar, cos $\alpha$ will be close to 1 supporting the hypothesis that output growth of individual products is being translated into export growth. If $\alpha$ is large, then output gains are unrelated to trade pattern, suggesting that priorities other than foreign market demand are determining production decisions. In calculating cos $\alpha$ for the output and import vectors, we can identify policies of import substitution by a negative cos $\alpha$ caused by increases in production and declines in imports.

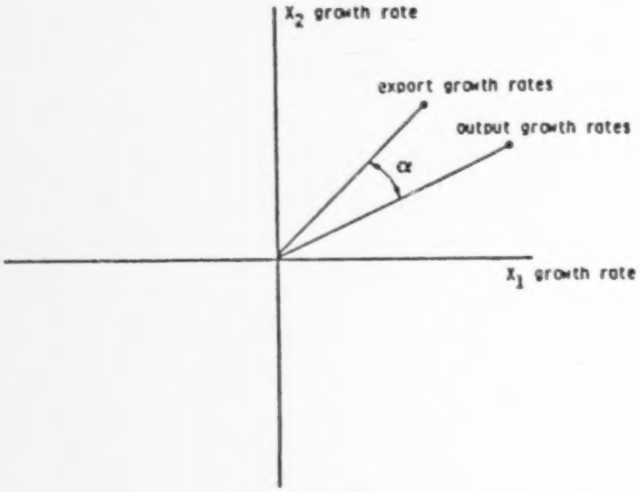
$X_2$ growth rate
export growth rates
output growth rates
α
$X_1$ growth rate

FIGURE 1

## TABLE 1.—HERFINDAHL-HIRSCHMAN CONCENTRATION MEASURES FOR POLISH INDUSTRIAL INVESTMENTS, 1970–72

[Based on investments in current prices]

| Industry | Number of subgroups | 1970 | 1971 | 1972 |
|---|---|---|---|---|
| Mining, fuels and power | 8 | 0.211 | 0.215 | 0.213 |
| Metallurgy | 4 | 356 | .403 | .452 |
| Machine-building and metals | 26 | .049 | .044 | .051 |
| Chemicals | 10 | .060 | .067 | .089 |
| Minerals, building materials | 7 | .138 | .150 | .190 |
| Wood-paper | 5 | .256 | .202 | .194 |
| Light | 8 | .088 | 116 | .128 |
| Food | 8 | .079 | .082 | .097 |
| Others | 3 | .040 | .033 | .028 |
| All industry | 79 | .025 | .029 | .025 |

Source Poland, Glowny urzad statystyczny, Rocznik inwestycji i srodkow trwalych 1973, 64–74.

## TABLE 2.—HERFINDAHL-HIRSCHMAN CONCENTRATION MEASURES FOR THE GROSS VALUE OF OUTPUT OF THE MACHINERY AND METALS AND CHEMICAL INDUSTRIES IN POLAND (1970, 1973, 1975, 1980)

| | Number of subgroups | 1970 | 1973 | 1975 | 1980 |
|---|---|---|---|---|---|
| Machinery and metals industry of which: Metals | 8 | 0.2210 | 0.2153 | 0.2060 | 0.1961 |
| Machine building | 14 | .0839 | .0897 | .0862 | .0856 |
| Precision industries | 5 | .328 | .845 | .3636 | .1437 |
| Means of transportation | 6 | .202 | .2067 | .2155 | .2624 |
| Electrical and electronic | 6 | .2598 | .2618 | .2820 | .2470 |
| Chemical industry | 13 | .1030 | .1011 | .1039 | .1037 |

Source Poland, Glowny urzad statystyczny, Rocznik statystyczny przemyslu 1974, 1976, 1981

## TABLE 3.—INTRASECTOR CONCENTRATION IN CZECHOSLOVAK INDUSTRY, 1967–77

| Sector | Number of branches | Standard deviation of branch shares | | | |
|---|---|---|---|---|---|
| | | 1967 | 1972 | 1975 | 1977 |
| 1. Fuels and coal and coke products | 9 | 73.14 | 74.32 | 73.49 | 98.40 |
| 2. Production of heat and electricity | 2 | 1,278.31 | 783.59 | 774.71 | 610.79 |
| 3. Ferrous metallurgy | 34 | 5.37 | 4.48 | 4.01 | 3.96 |
| 4. Nonferrous metallurgy | 24 | 19.02 | 11.26 | 11.91 | 12.23 |
| 5. Chemical and rubber industry | 46 | 2.24 | 2.34 | 2.75 | 3.31 |
| 6. Machine building and metal working | 179 | 0.23 | 0.22 | 0.22 | 0.23 |
| 7. Building materials | 12 | 21.70 | 21.43 | 22.63 | 25.23 |
| 8. Woodworking industry | 12 | 45.09 | 47.63 | 54.13 | 48.64 |
| 9. Paper and cellulose products | 8 | 77.81 | 69.57 | 58.95 | 63.36 |
| 10. Glass, ceramics and porcelain | 13 | 21.06 | 23.09 | 18.96 | 17.96 |
| 11. Textiles | 37 | 7.46 | 7.01 | 6.76 | 7.33 |
| 12. Ready-made goods | 7 | 271.77 | 241.24 | 236.61 | 246.09 |
| 13. Leather, furs, and footwear | 12 | 76.44 | 66.68 | 57.66 | 64.46 |
| 14. Printing and cultural goods | 12 | 113.08 | 120.48 | 127.69 | 125.74 |
| 15. Food and beverages | 28 | 16.95 | 17.03 | 17.90 | 16.44 |
| 16. Other industrial products | 6 | 112.71 | 130.10 | 128.17 | 126.79 |
| Standard deviation for all industry | | 18.67 | 19.22 | 20.01 | 20.61 |

## TABLE 4.—HUNGARY: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS BY INDUSTRY

| | Time span | | |
|---|---|---|---|
| | 1970–1960 | 1975–1970 | 1977–1970 |
| (1) Mining plus electric energy: | | | |
| Exports = 2 | 0.561 | –0.999 | 0.248 |
| Imports = 6 | .133 | .667 | .879 |
| (2) Ferrous metallurgy: | | | |
| Exports = 8 | .737 | .573 | .730 |
| Imports = 15 | .719 | .345 | .165 |
| (3) Heavy and light metallurgy: | | | |
| Exports = 4 | .412 | .550 | .599 |
| Imports = 2 | .670 | .165 | .042 |
| (4) General engineering: | | | |
| Exports = 5 | .923 | .684 | .785 |
| Imports = 4 | .179 | –.580 | –.221 |
| (5) Machine tools: | | | |
| Exports = 3 | .983 | .651 | .836 |
| Imports = 3 | –.453 | –.850 | –.971 |
| (6) Machines for light and food processing industry: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 2 | .486 | –.207 | .968 |
| (7) Tractors and agricultural machines: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 5 | .141 | –.216 | –.258 |
| (8) Means of communication: | | | |
| Exports = 7 | –.197 | .291 | .849 |
| Imports = 8 | .566 | –.660 | –.183 |
| (9) Electric Machinery, appliances, and household machinery: | | | |
| Exports = 3 | .007 | .197 | .321 |
| Imports = 4 | .304 | .210 | .136 |
| (10) Telecommunications and vaccuum technical products: | | | |
| Exports = 8 | .740 | .085 | .503 |
| Imports = 5 | .073 | –.119 | –.728 |
| (11) Precision engineering: | | | |
| Exports = 4 | .916 | .874 | .895 |
| (12) Metal mass products: | | | |
| Exports = 3 | .313 | .613 | .407 |
| (13) Building materials: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 3 | .844 | –.254 | –.554 |
| (14) Fine ceramics and grinding products: | | | |
| Exports = 1 | 1.000 | –1.000 | 1.000 |
| Imports = 1 | 1.000 | –1.000 | –1.000 |
| (15) Glass industry: | | | |
| Exports = 2 | .982 | –.966 | .821 |
| Imports = 2 | .912 | –.930 | –.961 |
| (16) Insulating and other building materials: | | | |
| Imports = 1 | 1.000 | –1.000 | –1.000 |
| (17) Organic and inorganic chemicals: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 7 | .256 | .308 | .602 |
| (18) Coal conversion and oil refining products: | | | |
| Exports = 5 | .709 | –.334 | .086 |
| Imports = 4 | .924 | .886 | .836 |
| (19) Medicaments: | | | |
| Exports = 4 | .998 | .867 | .988 |
| (20) Rubber and synthetic materials: | | | |
| Exports = 4 | .808 | .091 | .533 |
| Imports = 5 | .006 | .124 | .089 |
| (21) Detergents, dyes, auxiliary materials for industrial use, photo chemicals: | | | |
| Exports = 2 | .420 | –.899 | –.690 |
| Imports = 1 | 1.000 | 1.000 | 1.000 |

## TABLE 4.—HUNGARY: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS BY INDUSTRY—Continued

| | Time span | | |
|---|---|---|---|
| | 1970-1960 | 1975-1970 | 1977-1970 |
| (22) Agricultural chemicals: | | | |
| Exports = 1 | 1.000 | −1.000 | 1.000 |
| Imports = 3 | .813 | .155 | .035 |
| (23) Wood industry: | | | |
| Exports = 2 | .775 | −.769 | .693 |
| Imports = 5 | .713 | .466 | .012 |
| (24) Paper industry and printing: | | | |
| Exports = 3 | .525 | .424 | .691 |
| Imports = 4 | .714 | .512 | .362 |
| (25) Textile and clothing industry: | | | |
| Exports = 16 | .335 | .695 | .721 |
| Imports = 11 | .481 | .183 | .242 |
| (26) Leather, fur, footwear: | | | |
| Exports = 4 | .468 | .807 | .553 |
| Imports = 3 | .807 | .448 | .828 |
| (27) Meat and poultry processing: | | | |
| Exports = 6 | .655 | .590 | .637 |
| Imports = 2 | .511 | −.967 | −.984 |
| (28) Dairy products: | | | |
| Exports = 2 | .749 | .726 | −.762 |
| Imports = 1 | 1.000 | 1.000 | −1,000 |
| (29) Canning and preserving: | | | |
| Exports = 7 | .828 | .858 | .592 |
| Imports = 2 | .769 | .938 | .986 |
| (30) Four milling: | | | |
| Exports = 3 | .010 | −.310 | .031 |
| Imports = 3 | .998 | −.869 | −.407 |
| (31) Bakery and confectionary: | | | |
| Exports = 0 | 1.000 | 1.000 | 1.000 |
| Imports = 1 | −1.000 | 1.000 | 1.000 |
| (32) Vegetable oil and fat processing: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 1 | 1.000 | 1.000 | 1.000 |
| (33) Distillery and starch industry: | | | |
| Exports = 2 | 1.000 | .734 | .764 |
| Imports = 4 | .827 | .210 | .113 |
| (34) Tobacco industry: | | | |
| Exports = 1 | 1.000 | 1.000 | 1.000 |
| Imports = 1 | 1.000 | −1.000 | −1.000 |

## TABLE 5.—CZECHOSLOVAKIA: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS IN TRADE WITH SOCIALIST COUNTRIES, BY INDUSTRY

| | Time span | | |
|---|---|---|---|
| | 1972-1967 | 1977-1972 | 1977-1975 |
| (1) Fuels, coal and coke products: | | | |
| N = 6 X | −.206 | .426 | .460 |
| M | −.692 | −.688 | .051 |
| (2) Heat and electricity: | | | |
| N = 1 X | 1.000 | 1.000 | 1.000 |
| M | 1.000 | 1.000 | 1.000 |
| (3) Ferrous metallurgy: | | | |
| N = 11 X | .558 | .721 | .239 |
| M | −.391 | −.027 | .228 |
| (4) Nonferrous metallurgy: | | | |
| N = 6 X | −.503 | −.024 | .574 |
| M | −.034 | .359 | .474 |

## TABLE 5.—CZECHOSLOVAKIA: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS IN TRADE WITH SOCIALIST COUNTRIES, BY INDUSTRY—Continued

| | Time span | | |
|---|---|---|---|
| | 1972-1967 | 1977-1972 | 1977-1975 |
| (5) Chemical and rubber industry: | | | |
| N=13 X | .188 | .592 | −.323 |
| M | −.188 | −.007 | .505 |
| (6) Machine building and metal working: | | | |
| N=39 X | .145 | .348 | −.279 |
| M | −.010 | −.092 | .046 |
| (7) Building materials: | | | |
| N=2 X | .813 | .993 | −.809 |
| M | −.242 | −.888 | .781 |
| (8) Woodworking industry: | | | |
| N=2 X | .851 | .705 | −.113 |
| M | −.930 | .389 | −.998 |
| (9) Paper and cellulose: | | | |
| N=2 X | −.649 | .896 | .986 |
| M | −.812 | .838 | −.990 |
| (10) Glass and ceramics: | | | |
| N=3 X | .994 | −.600 | −.911 |
| M | .197 | .680 | .391 |
| (11) Textiles: | | | |
| N=3 X | NA | .598 | −.460 |
| M | NA | NA | NA |
| (12) Ready-made goods: | | | |
| N=1 X | 1.000 | 1.000 | 1.000 |
| M | −1.000 | −1.000 | −1.000 |
| (13) Leather, furs, and footwear: | | | |
| N=2 X | .938 | −.098 | −.791 |
| M | −.976 | .597 | .845 |
| (14) Printing and cultural goods: | | | |
| N=10 X | .989 | −.305 | .877 |
| M | .615 | .900 | −.400 |
| (15) Food and beverages: | | | |
| N=9 X | −.009 | .065 | .103 |
| M | .659 | .023 | .206 |

## TABLE 6.—CZECHOSLOVAKIA: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS IN TRADE WITH CAPITALIST COUNTRIES, BY INDUSTRY

| | Time span | | |
|---|---|---|---|
| | 1972-1967 | 1977-1972 | 1977-1975 |
| (1) Fuels, coal and coke products: | | | |
| N=6 X | 0.275 | 0.498 | −0.268 |
| M | −.929 | −.230 | .509 |
| (2) Heat and electricity: | | | |
| N=1 X | −1.000 | −1.000 | −1.000 |
| M | −1.000 | −1.000 | −1.000 |
| (3) Ferrous metallurgy: | | | |
| N=11 X | .103 | .212 | −.234 |
| M | .103 | −.192 | .116 |
| (4) Nonferrous metallurgy: | | | |
| N=6 X | .385 | −.814 | .238 |
| M | .683 | .394 | .182 |
| (5) Chemical and rubber industry: | | | |
| N=13 X | .017 | .541 | .763 |
| M | .227 | .333 | .221 |

TABLE 6.—CZECHOSLOVAKIA: COSINES OF PRODUCTION AND EXPORT AND OF PRODUCTION AND IMPORT GROWTH RATE VECTORS IN TRADE WITH CAPITALIST COUNTRIES, BY INDUSTRY—Continued

| | Time span | | |
|---|---|---|---|
| | 1972-1967 | 1977-1972 | 1977-1975 |
| (6) Machine building and metal working: | | | |
| N=39 X | .144 | -.033 | -.225 |
| M | .130 | -.111 | .131 |
| (7) Building materials: | | | |
| N=2 X | .968 | .999 | .165 |
| M | .802 | -.760 | .427 |
| (8) Wood working industry: | | | |
| N=2 X | .992 | .850 | -.919 |
| M | .990 | .920 | .260 |
| (9) Paper and cellulose: | | | |
| N=2 X | .598 | .928 | -.530 |
| M | -.966 | .735 | .802 |
| (10) Glass and ceramics: | | | |
| N=3 X | .981 | -.712 | -.483 |
| M | .194 | .649 | .933 |
| (11) Textiles: | | | |
| N=3 X | NA | .996 | -.003 |
| M | NA | NA | NA |
| (12) Ready-made goods. | | | |
| N=1 X | -1.000 | -1.000 | -1.000 |
| M | 1.000 | -1.000 | 1.000 |
| (13) Leather, furs, and footwear: | | | |
| N=2 X | -.089 | .999 | -.961 |
| M | .844 | -.0821 | .991 |
| (14) Printing and cultural goods: | | | |
| N=10 X | .367 | -.479 | .992 |
| M | .665 | 1.000 | -.261 |
| (15) Food and beverages: | | | |
| N=9 X | .159 | .032 | .105 |
| M | .466 | -.380 | .480 |

For metallurgy and machine tools (industries 2–5) a general tendency toward import substitution is evident for all periods. During 1970–75 the congruence between production and exports is lowest but seems to increase for 1970–77. This suggests that 1970–75 was, for heavy industry, a period of disengagement from world market needs and of turning toward domestic needs, presumably not the goal of Hungarian industrial policy. For telecommunications and vacuum products, a similar pattern is evident. For these sectors as well as for a number of branches of light industry there appears to be a tightening of the output-export relationship by 1977, reflecting a return to export orientation in production patterns. Overall it is difficult to conclude that there was greater congruence between production and exports during the post-NEM period than in the pre-NEM period.

Tables 5 and 6 present similar calculations for Czechoslovakia. The main differences between these and Table 4 is that Czechoslovak data are expressed in value terms (constant prices for output, valuta Czech crowns for trade) and that trade is disaggregated between socialist and capitalist countries.

In heavy industry there appears to have been less import substitution in Czechoslovakia than in Hungary. At the same time, the congruence between production and exports appears to have increased for 1972–77 relative to the earlier period for trade with socialist countries. There is less congruence between output and exports to capitalist countries reflecting the emphasis of Czechoslovak industrial policy CMEA market. Another characteristic of the Czechoslovak results is the generally closer relationship between output and export growth in light industry than in heavy industry. This suggests that non-priority sectors in heavy industry have been able to obtain additional resources even if they have no export prospects; in light industry only sectors with export potential can expect to receive preferential access to investment funds.

These statistical results, based on somewhat different methods for the three countries in our sample, certainly do not point to any conspicuous success in implementing the industrial policies that the authorities wanted to preserve. However, the results, as we warned in the introduction to this paper, are still tentative. They may be biased due to intractable problems of excessive aggregation in our data. It may be also that the industrial policies put in place in the later 1960's and 1970's have not yet had time to yield fruit. We plan to carry out more detailed studies on industrial structure and exports in Eastern Europe that will hopefully provide a firmer basis for our conclusions.

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# EMPLOYMENT POLICIES IN SELECTED EAST EUROPEAN COUNTRIES: POLAND, CZECHOSLOVAKIA, AND HUNGARY

By Jan Adam[*]

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## I. INTRODUCTION

Most East European countries are going through difficult times marked by declining growth rates (Poland is experiencing a profound economic and political crisis); nevertheless they have managed to maintain full employment. In this contribution I will try to explain how socialist countries have contrived to achieve and maintain full employment; why various adverse phenomena (such as overemployment, labor hoarding and low labor discipline), which coexist with full employment, came about and to what extent they result from the policy of full employment; and what methods countries use to cope with underutilization of labor. The study will be confined to Poland, Czechoslovakia, and Hungary.

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[*] Professor of Economics, University of Calgary. I wish to express my gratitude to Macmillan Press Ltd. London for allowing me to use some of the materials from my book *Employment and Wage Policies in Poland, Czechoslovakia and Hungary Since 1950* in this contribution. I wish also to thank the Social Sciences and Humanities Research Council of Canada for the extended grant which enabled me to work on this contribution. The research for this paper was completed before the 1985 changes in the Hungarian economy were introduced.

## II. HOW DO SOCIALIST COUNTRIES MAINTAIN FULL EMPLOYMENT?

To understand how the mentioned countries manage to maintain full employment[1] it is first necessary to discuss how it came about.

In their critique of capitalism communist leaders regarded unemployment, which plagues capitalist economies from time to time, as one of the most important proofs of the inefficiency of the capitalist system. They pledged that, once they seized power, unemployment would be eliminated. And indeed, when they did seize power after the Second World War, full employment was put high on the list of priorities. In the last 35 years not much has changed in this respect; communist leaders continue to attach great importance to full employment. Whenever economic considerations conflict with the objective of full employment, the latter mostly obtains priority.

### A. STRATEGY OF ECONOMIC DEVELOPMENT AND RESOURCE CONSTRAINED SYSTEM

The strategy of economic development, taken over from the USSR, contributed substantially to the liquidation of unemployment. As is known, this strategy meant that industrialization and, within it, heavy industry became the main focus of development, and that industrialization was carried out at a maximum pace and was financed by agriculture and consumers. Since the three countries were short of capital but had an abundance of labor, particularly unskilled, labor played a paramount role in the industrialization drive. Production techniques were adjusted accordingly; in the basic production processes the most advanced production techniques accessible to the countries were used, whereas in auxiliary production processes and in administration labor intensive methods were used.[2] The planners believed that in this way more factories could be built, output maximized and, at the same time, unemployment reduced. The demand for labor was also fueled by the channeling of the bulk of productive investment funds into construction of new factories and little into modernization of existing ones.

The endeavor to achieve full employment has been very much aided by the fact that the socialist system is a resource constrained system.[3] Unlike enterprises in the capitalist system (a demand contrained system), which maximize profit, enterprises in the socialist system maximize output (whether gross or net is of no great relevance here). The only constraints to maximization of output are resources, including manpower resources. Since a socialist enterprise is in fact operating on the state account, it is not exposed to the employment constraints characteristic of a capitalist enterprise; it may expand employment beyond the point where a profit maximizing enterprise stops, as long as the newly hired workers contribute to the output of the enterprise. This behavior of enterprises is not in contradiction with the policy of the central planners, who view efficiency rather as a macroeconomic concept (not necessarily to be applied to each enterprise individually).

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[1] Full employment is usually understood to mean a situation in which everyone who wants to work can obtain a job. For divergent views on this topic see J. Adam, "Employment and Wage Policies in Poland, Hungary and Czechoslovakia since 1950," Macmillan, London, 1984, and St. Martin's Press, New York, 1984, ch. 4.

[2] M. Ellman, "Full-Employment—Lessons from State Socialism," De Economist, No. 4, 1979.

[3] J. Kornai, "Economics of Shortage," Amsterdam, 1980, vol. A, pp. 257–66.

The system of management of the economy also spurs enterprises to maximize output with accompanying maximization of employment. In the traditional Soviet system—which is nowadays applied in Czechoslovakia—this is the result of the assignment of output targets binding on enterprises and the acceptance of fulfillment and overfulfillment of plan targets as evidence of good performance and management. In line with this principle the size of the wage-bill and the bonus fund depends on the fulfillment of plan targets, and, as will be shown later, this arrangement stimulates enterprises to maximize output and employment.

Even in a decentralized system, where enterprises are not assigned plan targets, and therefore no targets for the wage-bill and bonus fund exist (as nowadays in Hungary), enterprises are interested in the maximization of employment. There are other reasons for this besides the effect of the resource constrained economic system. After all, even in a decentralized system, the performance of enterprises is evaluated with the help of certain indicators, and enough labor enables them to increase performance from year to year without being dependent on productivity increases. For more see later.

### B. INVESTMENT POLICY AND RETRAINING PROGRAMS

Problems of employment are not left to the free play of market forces. This is reflected primarily in investment policy and provisions for the jobless. In formulating investment policy employment needs have always been an important consideration. Many investment projects and their geographical location have been to a great degree influenced by the desire to create new job opportunities. Some believe that employment has often been given precedence over the needs of the economy. "In the practice of planning of the growth of employment it is not the real needs of the economy which are decisive"—writes the Polish economist B. Fick—"but the predicted increments in labor resources." [4] This was surely also the case when, in order to satisfy local demand for employment, plants were established, even though non-utilized capacities for the same products existed in other regions. A Czechoslovak minister complained that in his country the principle was gaining ground that investment should be mechanically channeled into areas where people desire to work.[5] The desire to satisfy social employment has been one of the main reasons why inefficient plants, sometimes even plants which produced unsalable products, have continued to operate.

Once people have found jobs and proved themselves in the probationary period (which is mostly a formality) they almost have job security, provided, of course, that they are not involved in political activities directed against the regime. The legal provisions governing dismissals are such that it is very difficult to dismiss workers for redundancy or incompetence. Some groups of workers are protected against dismissal (older workers, pregnant women, handicapped). In addition managers are reluctant to resort to dismissal, particularly in periods of labor shortages. The bulk of the labor turnover is a result of workers' decisions. If enterprises must dismiss workers it is their duty as well as the local governments' to help the dismissed find appropriate jobs.

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[4] B. Fick, "Polityka zatrudnienia a place i bódzce," Warsaw 1970, p. 1976.

[5] B. Sucharda, "Ekonomicky myslieť a konať," Bratislava 1967, p. 99.

All three countries have retraining programs (of different extensiveness) for persons who lose their jobs or who move voluntarily to labor-deficient enterprises. Retraining is financed by the government and/or the hiring enterprises. Workers undergoing retraining receive pay, and once they start to work in a new job they receive supplements to wages for some time if the earnings in the new job are lower than in the old one.

### C. REGULATION OF LABOR SUPPLY

In the three decades which have elapsed from the start of central planning Poland and Hungary (in particular the former) have been threatened a few times by unemployment. (Czechoslovakia has had rather opposite worries due to the expulsion of most of the German population). In all cases, when unemployment has threatened, they have used quite successfully one or more tools for regulating the economic activity of women, youths and persons of pensionable age in order to cope with the threat. The expansion of the private sector has also played an important role in this effort.

Regulation of the economic activity of people of pensionable age is perhaps the most important tool. In Czechoslovakia and Hungary the retirement age is relatively low (60 years for males and 55 for females). It is not clear why the retirement age has been set so low. It is conceivable that the desire to make full employment easier played an important role. Regardless of the reasons, the planners have acquired a tool for regulating the economic activity of persons in their early sixties or mid-fifties. If proper incentives are applied they can be made to continue working at least part-time, or, if the need arises, they can be removed from the labor force altogether. What is also important, the incentives (or even administrative methods) can be used selectively; they can be directed to certain occupations, to work in certain sectors of the economy or even in certain enterprises according to the needs of the economy.

In Poland the official retirement age is still 65 (for males) and 60 (for females) with some exceptions. Even there it is possible to regulate the economic activity of retirement age persons by changes in the level of pensions, as in the other countries, but dropping the retirement age of certain groups or in certain periods is the primary regulation method.

Poland and Hungary (primarily the first) have several times used changes in the provisions for work after pensionable age to alleviate unemployment. In 1957 Poland suffered from unemployment. The fight against it was waged on two fronts: on the one hand the government released funds for creation of new jobs and on the other hand, it vacated many jobs held by pensioners.[6] For this purpose old age pensions—which were very low and therefore people were eager to continue working—were increased by 47.5%.[7] As a result the number of retirees in 1959-60 increased by 170,000, whereas in the period 1955-58 only small changes took place.

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[6] A. Rajkiewicz, "Zatrudnienie w Polsce Ludowej w latach 1950–70," Warsaw 1965, p. 138.

In 1981 some economists calculated that, as a result of the economic crisis, Poland would be hit by unemployment in the range of one million.[8] These fears turned out to be ill-founded; on the contrary, the labor market became tighter than before the crisis. And again changes in the provisions of the pension law—this time a temporary reduction in the retirement age—helped to avert unemployment. It is interesting that the number of people who took advantage of the change in the pension law greatly exceeded the assumed figures, and, in order to mitigate labor shortages, manual workers were allowed to return to work without affecting their rights to earlier retirement.[9]

All three countries have nowadays a maternity leave program which allows an employed mother to stay at home with her newborn child for a certain length of time while receiving a certain allowance, without losing claim to her job. The program was first introduced in Hungary (1967), then in Poland (1968) and finally in Czechoslovakia.[10] The reasons for this program were several; in Poland and Hungary it was also motivated by employment considerations, by the fear that the economy would not be able to absorb the increments in the working age population resulting from the postwar baby boom. In Hungary this demographic development happened at a time when the planners were readying for an economic reform and were afraid that the introduction of profit as a new evaulation indicator would spur managers to higher labor economy and thus generate unemployment.[11] Therefore they decided to undertake several provisions against possible unemployment, and the prolonged maternity leave was one of them.

Regardless of the reasons for its introduction, the prolonged maternity leave once introduced can serve to regulate the female labor supply, since nowadays more than 10% of the female labor force takes advantage of it. To use it in such a way requires adjusting the length of the leave and/or the level of the allowance according to the needs of the economy.

In Poland and Hungary the prolonged maternity leave program helped to reduce female unemployment. It is probable that the introduction of an allowance for women on prolonged leave in Poland in 1981 was intended to influence female employment and thus contribute to the prevention of unemployment. Statistical figures show that this action was quite successful (in 1981 the number of women on maternity leave was 624,557 against 487,185 in 1980).[12]

The central planners in Poland and Hungary also use the expansion of the private sector for maintaining full employment. The private sector reached its nadir in 1953 and 1954 in Hungary and Poland respectively, and in 1956–8 in Czechoslovakia. It experienced, however, some expansion during political crises and their aftermath (1956–7 in Poland and Hungary), at the start of major economic reforms (after 1968 in Hungary, some attempts in Czechoslovakia in 1968) and in periods of unemployment or threats of unemployment. This means that the private sector can be used not only to ease unemployment or the threat of unemployment, but also to help defuse political crises; a more liberal treatment of the private sector can be interpreted as a sign of the regime's increasing tolerance, and this may contribute to political stability. During economic reforms, which are geared to an increase in economic efficiency, the expansion of the private sector may work in this direction by absorbing redundant workers in the state sector and by reducing pressure on the state sector to create new jobs.

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[7] F. Krogulski, Przeglad Ubezpieczen Spolecznych. no. 2, 1959.

[8] J. Krasniewski, Trybuna Ludu, Sept. 2, 1982.

[9] Trybuna Ludu, July 30, 1982.

[10] In Hungary the prolonged maternity leave is extended to three years for each child, in the CSSR only up to two years for the second child, and in Poland up to four years for each child.

[11] A. Vida Horváth, Munkaügyi Szemle, no. 9, 1971.

[12] Zatrudnienie w Gospodarcze Narodowej 1982, annual publication of the Statistical Board in Warsaw, p. 81.

Starting with the second half of the seventies, but mainly in the beginning of the eighties, several factors coincided in Poland and Hungary to make the expansion of the private sector more desirable. In Poland the failure of the new strategy of economic development, introduced in the beginning of the seventies, generated among other things increasing market disequilibria. The situation became even worse when Poland tried to ease the situation by price increases in 1980. The threat of unemployment was also looming on the horizon. Therefore the employment plan for 1976–80 envisaged that, of the 1,100,000 planned addition to the work force, 500,000 would find employment in the private sector (300,000 in agriculture and the rest in services).[13] This provision was motivated by concern about the high investment outlays incurred in job creation and also by the fear that the socialist sector would not be able to absorb the manpower resources. The target for agriculture was not met; on the contrary, the number of persons economically active in agriculture declined. The work force in the private nonagricultural sector increased in terms of percentage quite substantially (in 1976–80 by 28%),[14] but in terms of numbers it was far below the plan target.[15] One of the reasons for the slow expansion of the private sector was the tax system which discriminated against private businesses employing several workers[16] and which has been recently changed.[17] It is necessary to wait and see whether the new tax provisions will bring a great change in the expansion of the private sector. Despite its small increases, the private sector can be listed among the factors which contributed to the avoidance of unemployment.

Recently, in connection with increasing difficulties in the economy and shrinking job opportunities in industry and construction, the Hungarian government, to boost the private economy, has come up with new initiatives which went into effect on January 1, 1982. Among the provisions adopted it is worthwhile mentioning that the local authorities are obliged to issue a license for the operation of a private handicraft business to every eligible applicant, and that the state sector is allowed to use the services of the private sector. Furthermore the internal trade authorities lease small businesses (consumer goods stores, service outlets) for five years, and state enterprises are allowed to contract out a section of their undertaking which employs no more than 15 people.[18] Finally private cooperatives numbering up to 30 members can be established for the purpose of engaging in small-scale production and services (but not in commercial activities).

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[13] R. Mosóczy, "A KGST-országok gazdaságpolitikája 1976–80, "Budapest 1979, p. 145 and M. Kabaj, Praca i Zabezpieczenie Spoleczne, no. 1, 1980.

[14] Zatrudnienie w Gospodarcze Narodowej 1982, p. 1.

[15] For more see J. Adam, "Regulation of Labour Supply in Poland, Czechoslovakia and Hungary," Soviet Studies, no. 1, 1984.

[16] R. Skarzyński, Finance, no. 12, 1981.

[17] Trybuna Ludu, Sept. 17, 1982

It should be made clear that Hungary neither expects nor wants a dramatic expansion of the private sector. No doubt the Hungarian government is keen to have the advantages of the private sector expansion but at the same time it is anxious to avoid the political risks involved. (Probably the same is true of Poland). Wages in the private sector are much higher than in the state sector, and this generates dissatisfaction in the state sector and exerts pressure for wage increases.[19]

## III. REASONS FOR UNDERUTILIZATION AND SHORTAGES OF LABOR

Full employment coexists with many negative phenomena, such as overemployment, labor hoarding, low labor discipline and labor shortages. The phenomena have in common the fact that they result in underutilization of labor which produces labor shortages.

Overemployment is usually defined as employment beyond the numbers needed to meet production targets at a given level of technology and average labor intensity.[20] Some groups of workers in such a situation of overemployment are underemployed. In my opinion, depending on whether we approach the problem from the viewpoint of enterprises (and the whole economy) or workers, one can talk of overemployment or underemployment. I prefer to use the term "overemployment." [21]

Labor hoarding is a special case of overemployment; it is more or less the result of conscious decisions by managers and is practiced for a certain purpose (e.g. to have enough labor for peak activities or to gain some advantage for themselves or employees).

Labor shortages are said to exist when the demand for labor cannot be satisfied in some sectors of the economy, though in other sectors overemployment exists. It can be argued that labor shortages result primarily from underutilization of labor.

To put it generally it can be said that all forces which have brought about full employment have also been instrumental in the generation of overemployment and labor shortages. Historically, however, overemployment in some sectors preceded full employment, and labor shortages came into being only later.

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[18] Magyar Közlöny, no. 54, Sept. 14, 1981 and I. Csillag, Figyelö, no. 45, 1981.

[19] For more see J. Adam, "Regulation of Labour Supply in Poland, Czechoslovakia and Hungary", op. cit.

[20] See e.g. M Kabaj, "Elementy pelnego i racjonalnego zatrudnienia w gospodarcze socjalistycznej," Warsaw 1972, p. 233.

[21] M. Bornstein uses ("Unemployment in Capitalist Regulated Market Economies and in Socialist Centrally Planned Economies," American Economic Review, May 1978) the term underemployment or disguised unemployment for a situation where workers have jobs but are underutilized ". . . because a) they wish full-time jobs but can get only part-time work; b) because their full-time jobs do not use all their skills and training; or c) because, though employed full-time in jobs matching their qualifications, their productivity is low."

Since the rise of overemployment has already been indirectly explained, I will concentrate on examining the reasons for labor hoarding and for some other phenomena of underutilization of labor and labor shortages. Later I will try to answer the question—to what extent can the policy of full employment be blamed for all these phenomena?

### A. LABOR HOARDING

Depending on how one defines the conscious decisions of managers the term labor hoarding can include more or fewer phenomena of underutilization of labor. I would rather stretch the term "conscious decisions" and also include phenomena which are on the borderline of labor hoarding.

It has already been mentioned that the adopted strategy of economic development also meant production techniques which supported expansion of employment. Such an approach to production techniques could not favor a policy of high wages. The massive influx of unskilled labor into the economy that occurred mainly during the period of the first medium-term plans had an unfavorable effect on productivity growth. This was not changed very much by the shift of labor from agriculture to industry where productivity is higher. The situation was compounded by the fact that, at the same time, many skilled workers left factories for jobs in governmental departments and agencies, and many unqualified housewives, self-employed people and employees of the service sector were recruited (sometimes against their will) for factory work. If, in addition, one considers the planners' obsession with maximum economic growth, reflected in increasing investment ratios and relegation of personal consumption to a residual, it is clear that average wages could only be low (relative to national income per capita). Increasing military expenditures due to the cold war also worked in this direction.

The policy of low wages [22] contributed to a rapid expansion of employment. On the one hand it created pressure on people to take jobs. In many middle-class families, which before the war had made a decent living from one employment income, the housewife was now forced to take a job to supplement the family budget. On the other hand the policy itself put pressure on authorities to create job opportunities for social reasons.

These employment and wage policies, established in the beginning of the 50's and continued to the present, have been a strong stimulus for enterprises to hoard labor. First, cheap labor discourages enterprises from looking for the most efficient methods of production and for substitution of capital for labor. This was evident primarily after the start of the economic reforms of the second half of the sixties, when enterprises received greater authority over investment decisions.

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[22] I label it so, regardless of whether it was intentional or whether it resulted form other policies.

Secondly, low wages combined with narrow wage differentials, a direct result of the policy of low wages, are inimical to rapid increases in productivity; therefore enterprises have met higher targets for output by expansion of employment.

Among other reasons for labor hoarding, rationing of labor (which controls over employment amount to) should be mentioned first; enterprises react to such a constraint in the same way as consumers react to rationing of goods. Regardless of the system of management, enterprises are interested in having enough labor to fulfill and overfulfill annual plans (in Hungary where enterprises themselves more or less determine the product mix, enterprises' own plans are meant), even if increases in the plan targets may occur during the year. In all three countries fear that a shortage of labor may deprive the personnel of bonuses is a strong stimulus for hoarding, all the more so under conditions of labor shortages.

Uneven spread of the work load during the year due to disruptions in the supply of materials and/or shortcomings in planning is another reason for labor hoarding. Usually at the beginning of any year or month economic activities are slow, while at the end of the year and month enterprises try to catch up with the plan targets through increased activity ("storming"). Such a work rhythm provides a strong incentive not to allow employment to drop much below the needs of the period of peak activities. Even in Hungary, where output targets are not assigned, enterprises behave in the same way. In this respect—according to one author [23]—the situation is worst in the machine industry, even worse than in food processing where output is much affected by seasonal factors. In the machine industry, economic activity in December is almost twice as intensive as in January.

It seems that military considerations also contributed to the hoarding of labor,[24] particularly during the early 1950's, a period of feverish preparation for a military conflict with the West. An integral part of this preparatory activity was the accumulation of reserves of skilled workers, primarily in militarily important production. One can speculate that once such reserves were created enterprises would try to maintain them.

Another reason for keeping labor reserves is the consequence of the government practice of obliging enterprises to make workers available for various special labor "brigades." These are brigades mostly for short term seasonal work in agriculture, but also for mining and construction (usually for a longer period), in brief for branches of production where normal recruiting remains below the plan target. This stimulus to labor hoarding was strongest in Czechoslovakia which started to suffer from labor shortages much earlier than the other two countries.

The wage regulation and/or incentive systems may also induce enterprises to hoard labor. In a centralized system, such as in Czechoslovakia, overfulfillment of output targets motivated by the wage regulation system provides such an incentive. In such a system, the actual wage bill in industrial enterprises depends on the extent to which assigned output targets are fulfilled. Overfulfillment of output targets was particularly attractive in the fifties when the actual wage-bill was permitted to exceed the planned one in exact proportion to the percentage of overfulfillment. Even with the less than proportionate adjustment now in effect, many enterprises still find it financially advantageous to overfulfill output targets. When overfulfillment can be achieved through better organization, improved production techniques or juggling the wage regulator, the wage-bill can be increased more than the additional costs involved. Often the possibility of overfulfillment depends on the availability of labor reserves—hence the stimulus to hoard labor. Moreover, overfulfillment of the output plan legitimizes "overfulfillment" of the limit for employment. Hiring new workers is advantageous mainly if they can be paid wages below the average, thus permitting circumvention of the plan target for average wage, if one is set.

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[23] F. Munkácsy, Munkaügyi Szemle, no. 8, 1978.

[24] This statement relies on information from knowledgeable sources.

The desire to circumvent this target can be a stimulus to hoard labor even in a decentralized system, as Hungarian experience shows. In 1968, when the New Economic Mechanism (NEM) was introduced, planners were uncertain about enterprises' reaction to the expansion of their economic autonomy and about price movements; they therefore imposed a 4% ceiling on wage increases in enterprises. Apparently they did not realize that the ceiling provided a built-in stimulus for hoarding labor; perhaps they were more concerned that NEM might generate unemployment because enterprises would dismiss workers in their efforts to increase efficiency.[25] Instead hoarding (mainly of unskilled labor and part-time workers [26] who could be paid wages below average) became prevalent as a way to circumvent the wage ceiling.[27] Hiring of new workers was also advantageous because they were not immediately eligible for bonuses.

The incentive system can also be an inducement to hoard labor. Whenever bonuses are linked to a target which can be achieved more easily by expanding employment, and when enterprises are not under sufficient pressure to be concerned with economic efficiency, there is a tendency to go this route. Even profit, as the regulator of the size of the bonus fund, which it is nowadays in all three countries, can act in this direction. More profit can be produced by hiring more labor.

If size of enterprise employment is an important factor in determination of basic salaries and/or bonuses of top managers, there is a further reason to hoard labor. In all three countries, earnings of top managers depend on the size of the enterprise they manage as measured by value of output and total employment, as well as on its economic importance.[28] Since the size of bonuses is usually set as a percentage of basic salaries, the level of employment also influences bonuses and total earnings.[29]

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[25] J. Lökkös, Társadalmi Szemle, no. 2, 1978.

[26] Part-time workers were counted as full-time workers for the purpose of average wage calculation. See D. Granick "Enterprise Guidance in Eastern Europe," Princeton, 1975, p. 263.

[27] L. Pongrácz, Társadalmi Szemle, no. 4, 1973 and A. Kemeny, Práce a mzda, no. 3. 1971.

[28] According to A. Szavai (Munkaügyi Szemle, no. 9, 1979) Hungarian top managers (directors and their deputies) of enterprises classified in the highest catetory received 69% higher basic salaries than their colleagues in enterprises classified in the lowest catetory. In terms of earnings the difference was 100%

The present attitude of enterprises concerning cooperation with other enterprises in vertical and horizontal directions contributes to hoarding of labor. In the fifties there was an excessive perchant for cooperation resulting from the fact that it was, in this way, easier to reach the target for gross value of output, which included not only the value of services rendered to other enterprises but also the value of the materials to which the service was applied. With the exclusion of the value of such materials from the gross value of output, cooperation lost much of its attraction. Simultaneously with the mentioned incentive to cooperate there has always been a built-in disincentive to cooperation, which has survived in Hungary even after the introduction of NEM. F. Munkácsy states that in Hungary one of the reasons for hoarding labor is the reluctance of enterprises to rely heavily on cooperation with specialized enterprises in meeting their own output targets. To ensure that their output targets are achieved managers tend to seek a certain amount of independence by expanding their activities both horizontally and vertically.[30] This means that enterprises must employ additional labor for activities which could be performed with a smaller number in specialized enterprises.

One can speculate that if such a trend exists in Hungary then it must be at least as strong in Czechoslovakia and Poland where managers can be assumed to be less efficiency conscious.

## B. OTHER SOURCES OF UNDERUTILIZATION OF LABOR

Underutilization of labor also results from factors other than those mentioned in the discussion of labor hoarding. It also results from the insufficient matching of qualifications of job holders with the qualifications required by the economy, the unfavorable structure of the labor force, excessive labor turnover and underutilization of work time. Here I will confine the discussion to the two more important factors—the structure of the labor force and underutilization of work time.

It is generally accepted in the three countries that the percentage share of white-collar workers and auxiliary workers in the labor force is excessive. For the first phenomenon the excesssiveness and the overstaffing of managerial and administrative work are held responsible. There has been a dramatic increase in the percentge of white-collar workers in the labor force during the last three decades. (However the percentage share of managerial and administrative workers in Hungary and Czechoslovakia for which we have figures has declined in recent years.)[31] These figures in themselves do not prove much, since in all countries, socialist and nonsocialist, the proportion of white-collar workers has increased due to the great technological progress and changes in the structure of the economy. There is, however, some evidence to support the assumption about the excessive number of managerial and administrative workers. In all three countries there is a shortage of manual workers but an excessive interest in managerial administrative work. Furthermore it is generally accepted that there is plenty of room for cutting down administrative and managerial work by better organization and more mechanization.

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[29] Such an arrangement exists not only in Hungary but also in Poland and Czechoslovakia. See Z. Jacukowicz, "Proporcje plac w Polsce," Warsaw, 1974, p. 63, and Z. Pokorná, Práce a mzda, no 9, 1979, p. 464.

[30] F. Munkácsy, Munkaügyi Szemle, no. 8, 1978.

[31] J. Bálint, "Társadalmi, rétegezödés és jövedelmek," Budapest 1983, p. 76 and "Statistická ročenka ČSSR 1982," p. 218.

It is generally agreed that in all the countries the number of auxiliary workers, mainly those who handle materials (transport, sorting and shelving) is too high. Even in Czechoslovakia, which is the most developed of the three countries, handling of materials is little mechanized. According to experts the mechanization of handling of materials in Czechoslovakia in the middle of the 70's reached only 20–22% (against 80% in the USA and West Germany).[32] Needless to say, more mechanization could release a great number of workers.

All three countries suffer from a gross underutilization of work time which results largely from low labor discipline. When it comes to quantification of the losses, views differ.[33] This is understandable because some of the time losses, e.g. at the workplace, can only be estimated.

The huge losses in working time result from: (1) deficiencies in the planning and organization of the production process, (2) what can be called lack of discipline at the workplace, (3) legitimate or unauthorized partial or full-day absenteeism.

To a great degree the first two causes are intertwined. Workers who frequently see that their work is not well organized due to their superiors' negligence and that they must stand idle for hours because the supply of the material to be processed is not smooth, or because equipment and documentation are missing, etc., do not feel that they violate the moral code if they waste time in a different way (by extending breaks, visiting friends for a chat, leaving the workplace before termination of the shift, etc.).

### C. REASONS FOR LABOR SHORTAGES

In his "Economics of Shortage" J. Kornai maintains that the socialist system, being resource constrained, produces shortages, including labor shortages. Such a system must sooner or later absorb all the people willing to work. The primary mover of this process is the ". . . expansion drive and closely related almost insatiable investment hunger".[34] There is no doubt that the socialist system works in such a direction. However it should be added that the same process which brings about labor shortages leads to overemployment and also to full employment. Moreover underutilization of labor—as mentioned—also produces labor shortages which in turn adversely affect utilization of labor. Historically overemployment arose first, at the earliest stage of central planning when full employment had not yet fully materialized, whereas evident labor shortages arose only in the 70's. Several factors were instrumental in making forces inherent in the resource constrained system bring about the labor shortages at that time. The most important fact may have been that the countries achieved very high, almost maximum employment participation rates, and were and are exposed to an unfavorable demographic development (the growth rates of working age population declined and will continue to decline for some time). In addition the participation rates of young people are declining due to the extension of time needed for education and professional training.

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[32] E. Mikes and J. Steinich, Plánované hospodárství, no. 11, 1975.

[33] For example, in Hungary some put losses in the range of 10–15%, but more pessimistic authors maintain that they are rather in the range of 20–30% of the potential work time. See J. Hatlacki, Munkaügyi Szemle, No. 1, 1976, and J. Timár, Közgazdasági Szemle, no. 12, 1976.

[34] J. Kornai, op. cit., p. 260.

The statistics of the 70's in Hungary and Poland showed a declining trend in the male participation rates in the age groups of 40–60.[35] The reasons for this phenomenon are not entirely clear, but no doubt one of them was the increasing number of disabled people. It seems that one of the main reasons for the growing number of disabled was the attractiveness of working in the private sector. In many cases a disability enables the pension to be supplemented by moonlighting in the private sector which pays well.

The prolonged maternity program, which in some periods helped to avert unemployment, in other periods contributed to labor shortages.[36]

### D. FULL EMPLOYMENT POLICY AND OVEREMPLOYMENT

The question can be posed: to what extent should the policy of full employment be blamed for all the adverse phenomena such as overemployment, labor hoarding, labor shortages and low labor discipline?

There is no doubt that the policy of full employment, as applied in the socialist countries, contributed to all the adverse phenomena mentioned. Once the policy of full employment is adopted and put into effect it is only natural that employment considerations often get priority over economic efficiency and that jobs are frequently created for social reasons. It is also natural that under such conditions the authorities cannot easily relocate workers and enforce labor discipline according to the needs of the economy. If one considers in addition that the system of management in many of its elements stimulates labor hoarding and other phenomena of underutilization of labor, then it is clear, why in the countries under review, full employment is accompanied by all these phenomena.

This does not, however, mean that the full employment policy in itself must necessarily lead to all the adverse phenomena mentioned. One could argue that the conditions under which it was put into effect, including the political system and the way the principle was implemented, are more to blame for them. The low level of labor discipline is a case in point. The difficulties in enforcing labor discipline in socialist countries result not so much from the full employment policy as from the nature of the political system. If the system were based to a great extent on the consensus of the population, the authorities could enforce more labor discipline, since they would not have to be afraid that unpopular measures could endanger the regime.

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[35] L. Pongrácz, Munkaügyi Szemle, Supplement II (1977) and Panel Discussion, Gospodarka Planowa, no. 7–8, 1975.

[36] For more see J. Adam, "Similarities and Differences in the Treatment of Labor Shortages," in J. Adam (ed.) "Employment Policies in the Soviet Union and Eastern Europe," The Macmillan Press, London, and St. Martin's Press, New York, 1982, pp. 123–9.

## IV. Government Policies for Coping with Underutilization and Shortages of Labor

For a long time governments relied on administrative methods for making enterprises follow the objectives of the employment plan. The rationing of labor, which is what the setting of employment limits amounts to, had to ensure that labor would be increasingly utilized more rationally. Only in the second half of the 60's did Czechoslovakia and Hungary (Poland in the 70's) introduce indirect (non-administrative) methods for the regulation of employment. This move was the logical result of the instituted economic reforms which aimed at giving greater room to the market mechanism. Before the economic reforms, when indirect methods came into play, they were a by-product of changes in the wage and incentive systems which were aimed at greater economic efficiency. However, in the 70's, when labor shortages became more entrenched, even Hungary resorted to direct methods (though not to general compulsory limits). Nowadays even Czechoslovakia, which generally adheres to the traditional Soviet system, does not assign employment limits.

In the following pages I will discuss the methods used for coping with underutilization of labor and labor shortages. I will start out with a discussion of administrative methods and then go on to indirect methods.

### A. ADMINISTRATIVE METHODS

In the beginning of the 50's East European countries took over the Soviet system of planning and with it the Soviet system of employment regulation. Like other important factors of production employment was subject to administrative control. In more concrete terms this meant that, of the four components which usually made up the assigned labor plan to enterprises, one referred to the number of employed. Employment, in contrast to other variables, was not assigned in the form of targets, but as a limit which enterprises were not expected to exceed under normal conditions.

Czechoslovakia dropped this system with the start of the economic reform in 1966. Soon after Dubcek's ousting in 1969, the new Czechoslovak leadership began to dismantle the decentralized system of management. An integral part of this action was the abandonment of indirect methods of employment regulation and their replacement by administrative regulation of employment. The national plan again included binding targets for employment, which were handed down to enterprises in the form of numerical limits on increases (or a minimum decrease) in the number of workers. Special provisions were made for preferential supply of labor to priority branches and enterprises, and for new enterprises. In addition control over allocation of young people entering the labor force and graduates of schools was strengthened. This system of employment regulation was in substance retained in the 70's.[37] Even as late as July 1981 the government confirmed its intention to continue the compulsory limits for employment in 1981–85 and to enforce them with the help of severe penalties. In 1982 the government suddenly changed its policy and freed enterprises from compulsory limits in the hope that incentives built into wage-bill regulation would stimulate enterprises to practice labor economy.[38]

In Poland the reform of 1973 gave enterprises converted to the new rules of planning and financing (experimenting enterprises) the right to make decisions about the level and structure of employment. Enterprises could enjoy this right for only a short period of time. During 1971–4 the Polish economy grew rapidly as a result of a huge investment program, financed to a great extent by loans received from the West. This rapid expansion enabled Poland to absorb great masses of job seekers into the labor force (in 1971–75 three and a half million people found jobs in the socialist sector for the first time), and to turn from a country marked by pockets of unemployment to a country with a tight labor market. This change in the employment picture affected unfavorably many important industries and enterprises; therefore the authorities decided to act. They did not assign formal employment limits to enterprises. These were, however, obliged to prepare an employment plan and forward it to the county governments for perusal. If the plan was approved it became binding on enterprises.[39] In 1982 an economic reform of the system of management was introduced. If the provisions of the reform are put into practice, Poland will have a far-reaching decentralized system. In the reformed system enterprises are supposed to have full autonomy; they are allowed to plan the product mix according to their own interests, and thus no targets (with some exceptions) are to be imposed on them. An integral part of this autonomy is that enterprises are allowed to determine the wage-bill and the size of the work force. The reformers assumed that the principle of self-financing adopted in the reform would induce enterprises to manage their operations with the minimum work force possible.[40]

Among the administrative methods, apart from compulsory employment limits, mention should be made of freezes on hiring, quota systems and orders to reduce the labor force. These methods are primarily applied to white-collar workers. Compulsory placing is another direct method which is applied primarily to blue-collar workers and certain groups of white-collar workers. It may refer to both enterprises and workers, which means that enterprises are allowed to hire workers only with the approval of national councils (local governments) or must hire workers who are assigned to them (this is the less frequent case).

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[37] R. Bakič, Plánované hospodářství, no. 10, 1971; V. Horváth, Práce a mzda, no. 7, 1976 and V. Bakajsa, Práce a mzda, no. 9, 1976.

[38] K. Formánek, Plánované hospodářství, no. 11, 1981; M. Pick, Práce a mzda, no. 10, 1982 and K. Ujházy, Plánované hospodářství, no. 8, 1982.

[39] See Życie Warszawy, November 9, 1976, and Tygodnik Demokratyczny, November 20, 1977.

[40] K. Golinowski, Gospodarka Planowa, no. 9, 1982; H. Król, Nowe Drogi, no. 12, 1982, and J. Meller, Praca i Zabezpieczenie Spoleczne, no. 8–9, 1982.

Judging by the decentralized nature of the Hungarian system, one would not expect any direct controls over employment in industrial enterprises. Indeed controls did not exist until 1976, when selective controls were introduced and applied up to 1981 affecting a minority of enterprises. Whether or not an enterprise was subject to such control depended on the category into which it was classified. All sub-branches and enterprises were classified by branch ministries and county (megye) governments into three categories according to their growth potential and needs for labor. Enterprises that were supposed to expand (Category A)—because of their efficiency and an unsatisfied demand for their goods—were not subject to limitations. Category "B" consisted of enterprises which were supposed to maintain a stable or somewhat smaller work force; these enterprises were under the control of placement agencies which had the right to review their claim for new workers and approve persons who applied to fill the vacancies. Category "C", which was the smallest and included enterprises scheduled for a major reduction in work force or for liquidation, could receive labor only through compulsory placement.[41] These provisions were abolished in 1981, mainly for two reasons. It has turned out that the categorization was a far cry from an objective undertaking due to lack of reliable data and to political influences.[42] Recently there has been a trend to greater decentralization, and controls over employment are contrary to such a trend.

All three countries try to curb the growth of employment of white-collar workers, mainly administrative and managerial staff (AMS). Despite substantial differences in the systems of economic management, the methods used in Hungary and Czechoslovakia were for some time quite similar. First the Hungarian government tried to achieve its objectives by appeals for voluntary compliance, but when these failed it introduced in 1976 a freeze on hiring, which was limited to AMS in profit-making enterprises. In 1977 the freeze was replaced by the limitation of employment of AMS to the ratio of the work force as it existed in 1975. The difference between the freeze and the new provision was that vacated jobs could be filled within the limit, whereas before they could not.[43] Later the administrative provisions were dropped, apparently in connection with the greater stress on market forces.[44]

In 1970 the Czechoslovak post-reform regime tried to cope with the growing administrative apparatus by ordering a 10% reduction in AMS. Because this provision had only a short-term effect, the government since 1975 has been experimenting with a twofold approach. On the one hand it has applied short-term provisions similar to the ones mentioned above,[45] and on the other hand it has been trying to work out a permanent mechanism in the form of the establishment of norms for the size of the white-collar labor force and its structure.[46] It seems that the latter approach has not been successful, since, for 1981–5, targets have been set for the reduction of AMS in the material and non-material spheres.[47]

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[41] See Munkaügyi Szemle, Supplement I–II, 1976, and Magyar Közlöny, no. 7, 1976.

[42] J. Czender and P. Màtyàs, Munkaügyi Szemle, no. 2, 1981.

[43] For more see J. Adam, "Labor Shortages in Hungary and their Treatment," Osteuropa Wirtschaft, no. 1, 1981.

[44] The statement is based on information obtained during my research stay in Hungary.

[45] M. Kotek, Hospodárskè noviny, no. 16, 1977, and no. 13, 1979.

[46] For more see J. Adam and J. Cekota, Revue d'Etudes Comparatives Est-Ouest, no. 4, 1980.

The enforcement of direct methods is not an easy task. Enterprises can usually find loopholes in the provisions if they wish to. Overfulfillment of plan targets in a traditional system may be a good excuse for exceeding employment limits. Enterprises are just as able to circumvent the quotas for employment of white-colar workers. Reclassification of some of the white-collar workers as manual workers is a good way to achieve the target, or part of it, without great effort.

### B. INDIRECT METHODS

Indirect methods aim at inducing enterprises to practice better labor economy, thus releasing labor for enterprises which suffer from shortages, and/or to moderate their demand for labor. Nowadays the three countries are trying to achieve these goals primarily by wage regulation and the incentive system. In addition they have tried to accomplish the first goal by making labor more expensive and the second by levying taxes on increases in employment above certain limits.

#### *1. Employment regulation by wage regulation*

For a long time the planners, in designing the wage regulation and incentive systems, tried to build into them an indirect stimulus to labor economy. This effort was the strongest in Hungary; there the several changes in the wage regulation system were conditioned to a great degree by the desire to enhance labor economy. The great stress on the wage regulation system in Hungary was motivated by the wish to avoid direct regulation of employment.

One would expect that the incentive system would play an even more important role than regulation of average wages or the wage-bill in the effort to improve labor economy. Yet the practice is different; the incentive system is more indirectly and generally geared to the labor economizing function.

To design wage regulation as an indirect method of employment regulation requires careful consideration of what to regulate. As is known, wages at the enterprise level can be regulated by controlling average wages or the wage-bill. Generally speaking it can be argued that wage-bill regulation is more conducive to labor economy. Average wage regulation by definition makes enterprises indifferent to the size of employment; it may be an outright stimulus to labor hoarding; hiring less qualified or part-time workers enables greater wage raises to be granted to workers already on the payroll. On the other hand wage-bill regulation makes managers interested in the number of employed, since maximization of per capita incomes can be achieved by saving labor.

Whether average wage and wage-bill regulation acts in the way mentioned depends on many factors, primarily on the nature of the system of economic management and the wage growth regulator. Wage-bill regulation in a centralized system—as historical experience shows—has usually encouraged expansion of employment beyond economic rationality. On the other hand average wage regulation, if tied to a labor productivity indicator whose numerator is computed from net output, may encourage labor saving under certain conditions.[48]

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[47] M. Pick, Pràce a mzda, no. 10, 1982.

The stimulation potential of wage regulation lies in enterprises having the right to determine or co-determine to what extent average wages can be increased as a result of labor saving.

The three countries have different wage regulation systems. Czechoslovakia uses a direct, traditional Soviet type system. Hungary (and recently Poland) employs what could be characterized with some qualification as an indirect system. In Czechoslovakia the planned wage-bill since 1970 has been centrally assigned to enterprises as a share in marketed output (starting from 1981 as a share in net output). The actual wage-bill depends on the extent of fulfillment of planned targets. Up to 1982 Czechoslovak enterprises which, in the planning stage, committed themselves to a reduction in the work force and fulfilled it could use all the savings thus gained for wage increase purposes. If the reduction was achieved in the process of fulfilling the plan (without an advance pledge) only 30-70% of the savings were available to enterprises. Since 1982 all the savings, regardless of whether there has been a pledge or not, have belonged to enterprises.[49]

Up to 1983 in Hungary mostly the wage-bill was regulated. (Before 1976 average wage regulation was the most important method.) It was not applied in its pure form; it was combined with average wage regulation once increases in average wages reached a certain set limit. The size of the wage-bill was linked to the growth of value added over the previous year. Taxation was used as a second instrument for controlling wage growth; taxes were paid from the bonus fund which is formed from profits earned by enterprises. The concrete application of the taxes changed several times. To put it with some simplification, no taxes were levied on wage increases to which enterprises were entitled by virture of their performance, and progressive, almost prohibitive taxes were levied on wage increases not matched by increased output.[50]

The planners pinned great hopes on the extension of wage-bill regulation as a stimulus to labor economy. They hoped it would encourage enterprises to practice greater labor economy, since the smaller the work force the greater the wage-bill per employee can be. This assumption is warranted if the savings in wages or a great part of them remain with enterprises for wage increase purposes. Yet the planners, in fear of inflation and excessive wage differentials, were not willing to grant enterprises even part of the savings due to labor economy. Not until 1980, when it became clear that wage-bill regulation in itself was not furthering labor economy, did the authorities allow enterprises a tax exemption for a 3% increase in average wage made possible by labor saving.[51]

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[48] For more see J. Adam, "Wage Control and Inflation in the Soviet Bloc Countries," The Macmillan Press, 1979, and Praeger Publishers 1980, pp. 63-72.

[49] See E. Moravec, Plánované hospodářství, no. 9, 1981, and M. Pick, op. cit.

[50] O. Gadó, "Közgazdasági szabályozó rendszerünk 1976-ban," Budapest, 1976, pp. 49-61; A. Rácz and L. Pongrácz, in L. Horváth (ed.), "Gazdasági szabályozók," Budapest, 1980, pp. 74-8.

[51] A. Rácz and L. Pongrácz, op. cit., p. 75.

It soon turned out that the great excitement about wage-bill regulation was ill-founded, and that even the incentive of a 3% tax exemption did not change enterprises' behavior much. In addition, many economists felt that wage-bill regulation in its existing form favored enterprises with great hidden reserves, whereas it put in a disadvantageous position highly efficient enterprises which were not able to increase their value added very much each year.[52]

As of 1983 average wages in most enterprises are regulated; their growth is linked to the level of profitability (jövedelmezöség) calculated as a ratio of produced profit to fixed assets plus the wage-bill. This means that the rate of wage growth no longer depends on performance compared to the previous year, but only on current profitability. The planners hope that this will encourage enterprises to fully utilize reserves. In order to make enterprises interested in labor savings, 30% of the saved wages can be used for wage increase purposes for the remaining workforce.[53] It is necessary to wait and see whether the 30% will be a sufficient incentive; if Czechoslovak experience is any guide, then the answer seems to be negative.

The 1973 Polish reform brought to enterprises which converted to the new rules of planning and financing a new wage regulation system, in many respects similar to the then existing Hungarian system. Enterprises were no longer assigned a wage-bill by the authorities; the size of the wage-bill depended on the growth of output added over the previous year. The planners expected that this system would encourage labor saving; that enterprises, in the effort to achieve higher average wages, would have to reduce their labor force, since increases in value added at a given normative (the rate at which the wage-bill increases with the increase in output added by one percent) can increase the wage-bill per employee in proportion to the decrease in the work force.

Despite the new wage regulation and incentive system (which was also supposed to stimulate labor economy) employment in enterprises which operated according to the provisions of the new reform grew twice as fast as in units with the old system. There were some reasons for this; but enterprises also used to their advantage the possibility of manipulating value added, prices on new products, etc.[54] This was one of the reasons why the wage regulation system was modified in 1976-7.

As mentioned in connection with the economic reform in 1982, enterprises were given the right to determine their wage-bill. In order to ensure some control over wage growth, the authorities imposed for a while a progressive charge (a quasi tax) on average wage increases, whose yields accrue to a special fund for occupational activation.[55] It very soon became clear that, contrary to the expectations of the planners, the new rules encouraged growth of employment. By hiring people with wages below average wages enterprises could reduce the pace of growth of wages and thus ease the charge payments. Yielding to the overall criticism of the way charges were applied, the planners changed the rules; starting with 1983 the charge is imposed on the wage-bill.[56] The planners hope that this charge, which would make labor more expensive, will have a favorable effect on labor economy.

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[52] L. Pongrácz, Munkaügyi Szemle, no. 8, 1982.

[53] R. Borlói, Figyelö, no. 48, 1982.

[54] See B. Holubicki, Gospodarka Planowa, nos. 6 and 9, 1977, and B. Gliński, "System funkcjonowania gospodarki," Warsaw 1977, pp. 40–41.

[55] The fund is used for financing creation of new jobs, payments of unemployment benefits and retraining cost.

### *2. Increases in labor costs*

It has already been mentioned that labor is cheap in the countries under review and for this reason enterprises are not interested in the substitution of capital for labor. To reverse this situation an increase in labor cost relative to cost of capital is needed. Since wage increases which would make a meaningful change in the cost relativities are not a viable solution, the same goal can be achieved by making labor costs to enterprises much higher or by reducing the price of machinery.[57] An increase in labor cost can be made by levying a tax on the wage-bill and/or by increasing the social security contribution paid by enterprises. It is therefore not surprising that all three countries during their economic reforms made provisions for increasing labor cost. Hungary in 1968 [58] and Poland in 1973 [59] imposed a tax on the wage-bill; Czechoslovakia in 1966, in connection with its economic reform, introduced a tax on gross income which was at the same time a tax on wages.

From the beginning of central planning all three countries made enterprises pay social insurance contributions. During the economic reform in Hungary and also in Czechoslovakia in the 70's, social insurance contributions were increased. One of the reasons for this move was just to increase labor cost.

### *3. Employment regulation by taxation*

Regulation of employment with the help of taxation means levying a tax on increases in employment and granting a tax credit for a reduction in employment. This method (speaking only of tax payment) is related to the method of employment regulation by increasing labor cost in that it also increases labor cost.

Among CMEA countries the attempt to control employment indirectly through taxation was first used by Czechoslovakia during the reform of 1966–69. Although the reform gave enterprises the right to make decisions about employment and its structure, the government retained the right to control employment by indirect methods. In 1967 a so-called "stabilization tax" was introduced: it was intended to control the growth of both wages and employment. Industrial enterprises were required to pay a tax equal to the additional wage costs involved for any increase in total employment. The tax did not apply to new factories or to employment of the partially disabled or to enterprises located in districts where labor reserves still existed.[60] The tax was largely ineffective because it was very small relative to enterprise revenues that were increased greatly by a general price reform in 1967.[61] The post-reform government cancelled the tax on employment but retained the tax on wage increases until 1978.

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[56] H. Król, Nowe Drogi, no. 12, 1982.

[57] This is what the Hungarians did in 1980. See B. Csikós-Nagy, Magyar árpolitika, Budapest, 1980, pp 126 and 128.

[58] In 1968, the tax was set at 8% and was increased to 13% in 1976. See O. Gadó, op. cit., p. 24.

[59] In Poland it was set at 20% of the wage-bill of all enterprises which converted to the new rules of planning and financing. See M. Kabaj, in A. Sajkiewicz (ed.), "Ekonomika pracy," Warsaw 1977, p. 62.

[60] Sbirka zákonů, no. 100, 1966.

Hungary also used taxation to control employment, but only for a brief period. A tax was imposed in 1970 to cope with labor hoarding brought about by the ceiling on wage increases; in 1971, when the government introduced a new method of wage regulation, the tax was dropped.[62]

Poland used, and it seems that it still uses, a tax for influencing employment in enterprises. To cope with rapid expansion of employment the Polish government in 1974 introduced a charge (a quasi tax) on employment increases. The charge was limited to enterprises that converted to the new system of planning and financing where the employment expansion was the largest. The tax was payable from the wage-bill into a special ministerial reserve fund. The charge when introduced was set at 20,000 Zl for an increase in employment of one person, which corresponded to a 5.5 months' average in 1975.[63]

In 1982 in connection with the economic reform, a discount from the charge, payable on average wage increases to the special fund for occupational activation, was given to enterprises if they reduced their work force compared to the previous year.[64]

### C. EVALUATION OF INDIRECT METHODS

Nowadays the wage regulation system combined with incentives for labor saving is the most important method in use for regulating employment. Before starting to discuss its effectiveness I would like to mention the reasons why the other two methods turned out to be ineffective.

Employment regulation by taxation can be successful provided the tax palpably affects the financial situation of enterprises. If this is not the case, because the tax is too small or because enterprises are not forced to watch their finances (due to the possibility of juggling prices, or to access to government subsidies, or for other reasons) then the taxation method is useless. Therefore regulation of employment by taxation makes sense only in a system where the financial situation of enterprises depends on their own performance. The Hungarian system (and more recently the Polish one) aspires to achieve such a situation but has not yet reached it.

In addition effective use of taxation requires a selective approach since hiring of new workers is not of the same importance to all enterprises. Application of a differentiated tax is in a sense contrary to the spirit of a decentralized system, but, what is even more important is the practical difficulty in setting it correctly. Probably the latter reason has been instrumental in that the Hungarian planners are presently not making use of taxation as an instrument for employment regulation in spite of their commitment to indirect methods.

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[61] J. Typolt, Plánované hospodařství, no. 2, 1968.
[62] J. Bokor, Pénzügyi Szemle, no. 12, 1973.
[63] M. Kabaj, in Ekonomika Pracy, op. cit., pp. 63–64.
[64] J. Meller, Praca i Zabezpieczenie Spoleczne, no. 8–9, 1982.

What has been said about employment by taxation in relation to the financial situation is also true about employment regulation by labor cost increases. In addition, increases in labor cost must be huge to have an effect of substitution of capital for labor since labor cost is substantially underestimated compared to prices of machinery and makes up on average only a small percentage of the total production cost of enterprises. (This percentage even declined in some countries after the inclusion of the tax on fixed assets in production costs.) The tax rate applied to the wage-bill and the increases in the social security contribution have been too small to have a great effect.

Employment regulation by wage regulation has not been very effective either and this is not surprising. The wage regulation system has to serve several functions and is difficult to design in a way that serves all functions equally well, all the more because some aspects of the functions may conflict. And this is also why the planners were reluctant for a long time to leave with enterprises a great portion of the money savings achieved by better labor economy. But now all the countries have reconciled themselves to such a solution; yet enterprises still do not try hard to achieve labor savings. It seems that managers value the possibility of having some labor reserves more than tiny increases in average wages. They may feel that in view of the present restrained wage policy, the central planners will not tolerate any more substantial increases in wages.

## V. Conclusion

It has been shown in the paper how the three countries have managed to avoid unemployment even at a time when the economy has stagnated or declined. Poland's economic situation is a case in point: despite a great decline in output, unemployment has not arisen. On the contrary, labor shortages are felt in various sectors. If we confine ourselves to the more recent period, it can be argued that the regulation of the labor supply—namely of the number of economically active retirees by adapting the conditions of their work to the needs of the economy, the size of the female work force through changes in long-term maternity leave, and the size of the private sector—played an important role in the efforts to avert unemployment. This is primarily true about Poland.

The three countries have been less successful in coping with the important objective of employment policy—efficient utilization of labor. Overemployment, particularly in industry, still plagues all three countries at a time when labor shortages exist in several sectors, including some branches of industry. Many obsolete and inefficient enterprises survive, often using skilled manpower which could be put to better use in thriving enterprises. Mechanization of administrative work and auxiliary production processes proceeds slowly. Labor discipline is still low.

The question can be posed: can there be a substantial turnaround in labor economy? In my view such a turnaround hinges on three conditions: enterprises' finances must depend more or less on their own performance, the price system must become rational, and labor costs must be at a level which will encourage a substitution of capital for labor. These are conditions which cannot be easily met, and therefore it cannot be expected that the situation in labor economy will change substantially in the near future.

Deceleration of economic growth in recent years has brought about an easing of labor shortages, mainly in Hungary. This trend may be strengthened for some time by a more extensive mechanization of auxiliary production processes and administration, and by channeling more funds into modernization of old plants instead of building new ones.

## Section D. Consumption and Population

# CONSUMPTION, LIVING STANDARDS, AND CONSUMER WELFARE IN EASTERN EUROPE

By Elizabeth M. Clayton[*]

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## SUMMARY

Personal welfare in Eastern Europe depends not only on material achievements expressed in per capita Gross National Product or National Income, but on more subjective indicators. This paper examines first the ideological commitment to egalitarianism, the idea that improving the lot of poorer members of society increases the well-being of society as a whole. Policies that equalize distribution include guaranteed full employment and social expenditures that benefit the poor, particularly housing and food subsidies. In addition, supplemental welfare measures are grafted to traditional measures: population is adjusted for its age composition; adult longevity and infant mortality are added, and finally some measures of political repression are considered. The results indicate substantial differences among the East European nations. The GDR, with the highest GNP per capita, also ranks high on indicators of politi-

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cal repression. Poland, with a lower per capita GNP than Hungary, has a better record in lowering infant mortality. The GDR and Czechoslovakia, with higher GNP per capita, fail to pass on benefits to consumers as well as Poland and Bulgaria, which have less economic capacity. In summary, indicators of material well-being can be supplemented by other social indicators to assess commitment to consumer welfare in these socialist countries.

## I. INTRODUCTION

Taken alone, the usual measures of personal consumption are well-understood and powerful indexes for measuring nations, but to be meaningful about the actual well-being of a people they should be supplemented by other information. Measures of personal consumption mechanically add up physical totals but ignore differences in both quality-of-life and distribution. To illustrate, consider the list of goods in personal consumption, added up and divided by the number of consumers who are deemed to be representative. The resulting number is only a rough index of economic well-being. The list itself is deficient: how can we include a measure for human rights, or an extended life span? The representative consumers are not adjusted for age or sex, and may not be "representative" for purposes of comparison: should the unborn be included, or just the male labor force? These are matters for a conceptual extension of our measures of economic well-being in Eastern Europe.

Consumption statistics are used to compare one Eastern economy to another or to a capitalistic economy, to compare it to itself over a period of time, or to measure its regional differences. As a standard, they are arithmetically convenient and they facilitate comparisons over time and space, but they are norms. Like all norms, there are implicit assumptions and omissions, often overlooked but deserving of discussion, and subject to change. These changes extend the range of our comparisons, for the norm that is appropriate for one comparison may be supplemented for another.

The basic comparisons here are standard of living indicators that have been carefully developed to be consistent over time and space. To these will be added, in the process, supplementary indicators of personal well-being that enhance our understanding of consumption and well-being in Eastern Europe and facilitate further comparison. The supplements can be considered in three parts: integrating the concept of egalitarianism, weighting of persons included as representative in the denominator of the measure, and the list of goods and services included in personal consumption.

## II. THE CONCEPT OF EGALITARIANISM

Turning to the concept of egalitarianism, note first that the measure is an arithmetic average, strongly affected by the inclusion of high-earners. This statistical artifact means most in comparisons of socialist economies to capitalist economies, where some few people who possess great wealth will enormously skew income distribution. In addition, however, the arithmetic average has an implicit normative significance. When the arithmetic average is used in comparisons over time or between regions or nations, where a higher average indicates higher well-being, it suggests that the best of possible worlds occurs where all time periods or all regions have the same number, i.e., where there is equality.

This idea of equality has a counterpart in the ideology of egalitarianism, the philosophical view that all people should, in economic respects, be considered equal and that the economic system that espouses egalitarianism is somehow superior to one that is not. Egalitarianism plays a strong role in Eastern European ideology. The origin of this belief is in Marx' view that people should receive income according to their need and in the Marxist goal that eventually all society's goods should be distributed on the basis of human need. This view of distribution has been justifiably criticized because it overlooks an economy's concerns with labor productivity based on differentiated wages, but egalitarianism is a powerful tool in the hands of political ideologues and legitimizes many economic activities of the modern socialist state. In addition the early Marxist manuscripts have given egalitarianism a new interpretation that counters the critics.

Marxists in Eastern Europe acknowledge not one, but two sorts of human economic needs. The first need is that common in our ordinary usage, the need for material well-being; it is insatiable, and provides the driving force for labor incentives. The second need is for self-realization: "The wealthy man is at the same time one who needs a complex of human manifestations of life and whose own self-realization exists as an inner necessity, a need." [Marx 1964, p. 164.] This need for self-realization afflicts all classes, rich and poor. It is satisfied through development as a social being in productive life. It is a need for work that distinguishes people from animals, who work only to satisfy material need. This concept of need counters the western criticisms of the feasibility of meeting need by altering a basic assumption. Since work has a positive utility, it provides its own incentive, or should, and differentiated wages can be a temporary, transitional phenomenon. In this reading, income distribution on the basis of need is feasible if one assumes that work, as well as goods, yields satisfaction.

This reading of Marxian need affects income statistics in Eastern Europe by focusing on the question of how we incorporate full employment, or the lack of it, into our national income accounts. In the ordinary per capita measures we make no adjustment and implicitly assume that society's goods are in some theoretical fashion available to all. The socialist practice of guaranteeing full employment to its citizens is a costly social perquisite that surely has value. To exclude it from the national income accounts is to prejudice a socialist-capitalist comparison.

Several statistical measures capture the difference between an economy that guarantees employment and one that does not. One adjustment subtracts the consumption per member of the labor force from consumption per worker; the difference between these statistics indicates the effect of unemployment. Another measure can quantify the cost of the unemployed by multiplying their number by the minimum or average wage. Another adjustment is the inclusion of unemployment benefits, including welfare, not as a transfer of income but as a cost to society. Again this would quantify the effect of unemployment in the GNP statistics and international comparisons.

Other socialist programs that equalize consumption between people include guaranteeing a minimum standard of living. The value of these programs—subsidized basic foods, a minimum wage—is not the size of the guarantee (which is captured in consumption statistics) but its very presence. It is both an insurance against disaster and an egalitarian compression of living standards by bringing up the bottom members of society. Like capitalist economies, the socialist economies have minimum wages but in addition have compressed the wage structure in favor of the bottom group, particularly in Bulgaria and Poland. Only Czechoslovakia has widened its wage structure in recent years. [See Wilczynski 1977, p. 105 and Adam 1979, p. 60–63.]

Basic food subsidies are another policy that bring up the standard of living for the poorest people. These subsidies are not included in estimates of personal consumption even though their result is to equalize economic conditions between people and particularly to increase the standard of living of the poor. The sum of these subsidies is significant. In 1981 food subsidies in Poland equaled $11 billion, more than one-fourth of the government's expenditures. [Cook 1982, p. 15.] These subsidies comprised about 75 percent of food value at the retail level, but are scheduled for a 15 percent reduction in 1984. [New York Times, November 20, 1983]. The GDR subsidizes about 28 percent of food value; Czechoslovakia 20 percent; Romania, an unknown but significant amount, as the price increase in February 1982 was the first in 20–25 years for some products. No information is available on Bulgaria. [Wadekin 1982, p. 201; RFE/RL, sr/0002, February 24, 1982.] These subsidies—the difference between retail price and cost of production—should surely be added to measures of standard of living.

Consumption in a Marxist system includes subsidies not only on goods purchased privately from income, but on goods distributed through the public sector, the "social" funds of consumption. Some have counterparts in capitalistic economies—public education, the services of roads and bridges—but other goods in the social consumption fund replace goods that must be purchased privately in capitalistic economies. The most important of these are public transportation and housing, which are made widely available to users at nominal or no fee. These goods are difficult to value. On one hand, they clearly contribute to material well-being and require expenditures of resources in their production; on the other hand, people have no choice about their production or use. There is no consumer sovereignty, or link between producer and consumer, and no known price that expresses a value set by the consumers.

One solution to this problem is to price the products at the supply (factor) cost of production, and assume that their production cost equals their value in consumption. In factor cost estimates [Thad Alton *et al,* OP–78 1983, p. 36–48] the growth in social funds of consumption, excluding housing, has been faster than the growth in private consumption expenditures in all Eastern Europe except Romania, as shown below:

## TABLE 1.—SOCIAL AND PRIVATE CONSUMPTION, EASTERN EUROPE, 1983

[1977 = 100]

| | Social consumption | Private consumption |
|---|---|---|
| Bulgaria | 119.6 | 111.9 |
| Czechoslovakia | 115.2 | 110.0 |
| German Democratic Republic | 122.9 | 112.6 |
| Hungary (1981) | 128.3 | 113.2 |
| Poland | 114.3 | 98.9 |
| Romania | 104.3 | 115.3 |

Source: Thad Alton et al, "Money Income of the Population and Standard of Living in Eastern Europe 1970–1982," OP-78, L.W. International Financial Research Inc., New York, 1983, p. 36–48.

The conclusion from these data is that social funds of consumption have increased both absolutely and relatively, which increases allocations on the basis of need, but decreases consumer sovereignty. This is true for all Eastern Europe except Romania.

Subsidized housing, prevalent in Eastern Europe, may be calculated separately from other social fund expenditures. Factor cost is an excellent measure of consumer value here because short run supply is inelastic and long run supply cannot respond to price in a socialist planned economy. At the subsidized housing price, there are queues, unsatisfied demand, and waiting time. Factor cost evaluation implicitly assumes that the value of waiting time equals the value of factors. This is plausible insofar as labor time is a large part of factor cost. People pay only 34 percent of housing cost in Romania and only 14 percent in Hungary. In between are Bulgaria, Czechoslovakia, Poland and the GDR whose people say 22 percent, 21 percent, 21 percent, and 17 percent respectively. [Data from Thad Alton et al. 1983, OP-77, p. 13-18.] These subsidies may be eroding as privately purchased cooperative housing has received new support and emphasis. Hungary has expanded private cooperatives and further plans by 1988 a 70 percent rent increase in subsidized apartments. [RFE/RL, sr/0004, March 17, 1982; sr/0013, September 7, 1982; sr/0015m October 14, 1982.] Poland has expanded private sector housing in place of public. [RFE/RL, sr/0014, August 13, 1982.] Housing also differs considerably in quality from one country to another. Shown below are data on household amenities in East European housing:

## TABLE 2.—HOUSING QUALITY

| | Piped water percent | Electric light percent | Telephones per 100 population [1] |
|---|---|---|---|
| Bulgaria (1975) | 67.8 | 99.8 | 11.6 |
| Czechoslovakia (1970) | 78.1 | 99.7 | 19.6 |
| German Democratic Republic (1971 | 82.1 | 100.0 | 17.7 |
| Hungary (1973) | 44.0 | 94.3 | 10.7 |
| Poland (1974) | 55.1 | NA | 8.8 |
| Romania (1966) | 12.3 | 48.6 | 5.6 |
| United States (1970) | 97.5 | NA | 77.0 |

[1] Denotes 1978, except Romania, which is 1975.

Notes.—NA denotes not available.

Source: (a) For all but Bulgarian water and electric: Statistical Abstract of the United States 1981, U.S. Department of Commerce, Bureau of the Census, Washington DC, p. 875,892; (b) For Bulgarian water and electric: Paul Shoup, The Eastern European and Soviet Data Handbook 1945–75, Columbia University Press, New York, 1981 and Hoover Institution Press, Stanford, CA 1981, p. 408.

In these years, most households had their own dwelling, ranging from Czechoslovakia (88 percent) to Poland (81 percent), with Hungary and Romania unknown. But few households had toilets: Czechoslovakia was highest (54 percent) with the same countries unknown [Shoup, pp. 408–412.]. Although the data are old, they indicate a standard of housing significantly lower than that in the United States at a similar time and unequal among East European nations.

## III. THE REPRESENTATIVE CONSUMER

Income statistics are calculated on a per capita basis, which assumes that each person is the statistical equal of another, yet the cost of living differs considerably among persons, particularly by age and family status. The following age equivalence scale, adapted from estimates based on British families [Clements 1975], has been estimated for Eastern European households:

TABLE 3.—*Age equivalence scales, Eastern Europe*

| | |
|---|---|
| Adult | 1.00 |
| Child 15 to 19 years | .59 |
| Child 10 to 14 years | .41 |
| Child 5 to 9 years | .35 |
| Child under 5 years | .25 |

These coefficients represent not the average cost of a person of a certain age, but the additional cost to the family, or the marginal cost of adding that person to a household. They indicate substantial economies of scale in household consumption, where the average cost per person of household services falls as household size is increased. These representative coefficients quantify an intuition that costs vary significantly by age and that with the same per capita expenditure a population with a younger average age has a higher standard of living than a population that is older. It also separates the decision to supply labor (labor force participation rate) from consumption levels.

Eastern European populations adjusted to reflect their age structures are shown below in two measures. The first column shows the share of population under age 20 in 1980. The second shows the 1980 population adjusted for differences in age structure. The data were converted to adult equivalents and the adjusted population is shown as a share of the unadjusted (total) population.

TABLE 4.—AGE-ADJUSTED POPULATION, EASTERN EUROPE, 1980

[Percent]

| | Population under age 20 | Adjusted population |
|---|---|---|
| Bulgaria | 29.1 | 0.824 |
| Czechoslovakia | 31.3 | .808 |
| GDR | 28.3 | .835 |
| Hungary | 27.7 | .830 |
| Poland | 31.9 | .806 |
| Romania | 33.0 | .797 |

Source: Calculations by author, based on data from Godfrey Baldwin, p. 218–224.

By these measures, Romania's actual standard of living is somewhat higher than its measured consumption expenditures because its population is on average younger. Polish and Czechoslovakian populations are also somewhat younger than the East European average. In contrast, Bulgarian, East German and Hungarian populations are somewhat older than the East European average, so that their rankings in intra-East European comparisons should be reduced.

Economies of scale in consumption negatively affect single person households; for example, a second adult in the equivalence scale above would be counted as 0.64 of the first adult. As it happens, East European countries apparently differ little in their share of single persons. The table below shows the shares of males and females age 45–49 who have never married. These data are only suggestive, of course. To them, when data become available, should be added the number of single persons who were previously married, of the never-marrieds in other age groups, and household status.

TABLE 5.—NEVER-MARRIED POPULATION AGE 45 TO 49, EASTERN EUROPE

[In percent]

| | Males | Females |
|---|---|---|
| Bulgaria (1975) | 7.7 | 9.7 |
| Czechoslovakia (1970) | 5.7 | 5.0 |
| GDR (1970) | 2.6 | 7.6 |
| Hungary (1977) | 4.4 | 4.0 |
| Poland (1974) | 3.9 | 6.4 |
| Romania (1966) | 2.7 | 4.3 |

Source: Demographic Yearbook, United Nations, New York, 1979, p. 899–902.

The household unit both buys goods and services and sells its labor, and this approach of measuring the representative consumer, which adjusts for the age composition of the population, sharply distinguishes between the household as consumers and as wage earners. By separating the household's consumption and labor supply decisions the effects of multiple earners in the family becomes clearer. Most East European households have multiple earners; our own households' standard of living would be relatively higher if spouses' "leisure" were included in national product. More important in the long term is the use of household services not so much in "leisure" as in capital formation, for the part that they play in human capital formation.

## IV. New Welfare Indicators in Standard of Living Accounts

Goods and services that are included in standard of living measurements are chosen because they are representative across nations and easily quantified. Yet there are a number of excluded measures that are widely regarded as indicators of a peoples' well-being: literacy, low infant mortality, adult longevity, human freedoms, to name a few. These can be, and are, measured separately or even aggregated: the "misery" index or sum of rates of unemployment and inflation; the Physical Quality of Life (PQLI) index, or sum of literacy, infant mortality and adult longevity rates

[Morris 1979]. But quality-of-life indicators are not ordinarily incorporated into national income accounting.

Three quality-of-life indicators rank high in our discussion of Eastern Europe: longevity of life (including infant mortality), human capital formation, and public order. Incorporating these into standard of living accounts requires a value commensurate with other values in the accounts. These values are shadow prices, in the sense that there is no market or exchange for these amenities. The values attached to quality-of-life indicators are imputed, not directly measured, and imply no sale or purchase of human rights or life itself.

Since the early 1950s, the East European population's life expectancy has clearly increased above the measured level by the lower probability of death by accident or disease. Life expectancy at birth for both men and women has increased since the 1950s, and infant mortality has declined. Data are shown in the tables below.

TABLE 6.—LIFE EXPECTANCY, EASTERN EUROPE, SELECTED YEARS

| | Men | | Women | |
|---|---|---|---|---|
| | At birth | At age 65 | At birth | At age 65 |
| Bulgaria: | | | | |
| 1956–57 | 64.2 | 13.4 | 67.6 | 14.5 |
| 1960–62 | 67.8 | 13.5 | 71.4 | 14.7 |
| 1965–67 | 68.8 | 13.4 | 72.7 | 14.7 |
| 1980 | 68.7 | | 73.9 | |
| Czechoslovakia: | | | | |
| 1956 | 66.6 | 12.5 | 71.6 | 14.3 |
| 1960–61 | 67.6 | 12.3 | 73.1 | 14.5 |
| 1969 | 66.2 | 11.6 | 73.2 | 14.5 |
| 1972 | 67.0 | 12.3 | 73.6 | 15.0 |
| German Democratic Republic: | | | | |
| 1956–57 | 66.3 | 12.9 | 70.6 | 14.5 |
| 1960–61 | 67.3 | 12.7 | 72.2 | 14.6 |
| 1967–68 | 69.2 | 13.1 | 74.4 | 15.6 |
| 1976 | 68.8 | 12.2 | 74.4 | 14.8 |
| Hungary: | | | | |
| 1955 | 65.0 | 12.6 | 68.9 | 13.8 |
| 1959–60 | 65.2 | 12.1 | 69.6 | 13.6 |
| 1964 | 67.0 | 12.6 | 71.8 | 14.4 |
| 1974 | 66.5 | 12.2 | 72.4 | 14.8 |
| 1979 | 67.0 | | 74.0 | |
| Poland: | | | | |
| 1955–56 | 61.8 | 12.4 | 67.8 | 15.0 |
| 1960–61 | 64.8 | | 70.5 | |
| 1965–66 | 66.8 | 12.8 | 72.8 | 15.4 |
| 1977 | 67.3 | | 75.0 | |
| Romania: | | | | |
| 1956 | 61.5 | 12.1 | 65.0 | 13.4 |
| 1963 | 65.4 | | 70.2 | |
| 1970–72 | 66.3 | | 70.8 | |
| 1974–76 | 67.4 | | 72.0 | |

Source: Demographic Yearbook, United Nations, New York, 1979, 557–9.

TABLE 7.—INFANT MORTALITY, EASTERN EUROPE, 1977–81

| | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|
| Bulgaria | 24.0 | 22.2 | 19.8 | 20.2 | [1] 19.5 |
| Czechoslovakia | 19.7 | 18.8 | 17.7 | 16.6 | [1] 16.8 |
| German Democratic Republic | 13.1 | 13.1 | 12.9 | 12.1 | [1] 12.3 |
| Hungary | 26.2 | 24.4 | 24.0 | 23.2 | [1] 20.6 |
| Poland | 24.6 | 22.5 | 21.1 | 21.3 | [1] 20.6 |
| Romania | 31.2 | 30.3 | 31.6 | 29.3 | ([2]) |

[1] Denotes provisional.

[2] Denotes not available.

Source: Demographic Yearbook 1981, United Nations, New York, 1983, p. 298–300. Infant mortality is defined as deaths of children less than one year of age per thousand life births.

Valuation of this increased life expectancy raises problems in conventional measurement. Most important is the "birth control" concept, which implies that increasing life expectancy will reduce total welfare. This problem is implicit in ordinary per capita measures, where consumption per capita rises when longevity falls and the welfare effect of preventing a birth or allowing a death is therefore positive.

To adjust the conventional measure, it is necessary to calculate the value of improved life expectancy (or reduced infant mortality) in terms of a higher probability of life, valued at the incremental income [Usher 1980]. Alternatively, this can be expressed as the willingness to pay for the probability that one's life will increase in length. In this context, it is important to note that:

(1) A general probability is not a person's certainty. We are examining the changes in probability of death as seen in the general death rate and not the specific instance of a certain death. This is the difference between lowering everyone's probability of death from air pollution and saving the life of a particular and identifiable person.

(2) People are willing to pay for the benefit of longer future life, even though there is no market for this explicit good. This concept needs to be net, however, because people also buy vodka and automobiles, which reduce life expectancy.

Adjusted by age structure, the value of improved life expectancy in developed countries increases the standard of living growth rate by ½ of a percent per year [Usher, p. 240]. This adjustment would seem to benefit particularly Poland and Romania, whose average life expectancy has grown faster than the rest, but actually results from their younger average age of population.

Increased life expectancy in Eastern Europe has occurred primarily from reduced infant mortality. Life expectancy at age 65 has stayed constant or even dropped. (By comparison, life expectancy at age 65 in the United States in 1978 was 16.3 years, ranging from 14.0 for white males to 18.4 for white females and has risen continuously since 1939 [Statistical Abstract of the United States 1981, p. 69–70.] The failure to lengthen adult life is particularly serious in Eastern Europe, and its causes can only be surmised.

First is undoubtedly the pollution of water and air: The Eastern bloc countries seem unable to invest significantly in life-saving cleanup programs. The elderly, whose death rate is commonly used as an index of pollution, are particularly at risk. Poland and

Czechoslovakia have infamously high levels of air pollution, particularly from burning coal, and unusable watercourses [Kramer, 1983]. Their situation is exacerbated by the Eastern bloc's highest ownership, along with the GDR, of automobiles. Czechoslovakian surveys on the effects of pollution are now heavily censored [RFE-RL, sr/0018, September 28, 1982] Romania has experienced water pollution in Lake Techirghiol and the Danube delta [RFE-RL sr/33, December 27, 1982; sr/20 November 24, 1982].

A second reason for decreased or constant life expectancy at age 65 is the low standard of care for the aged. The year 1982 was the worldwide "Year of the Aged" and provided some glimpses into the quality of life for this age group in Eastern Europe. As elsewhere, pensions are often unable to sustain life alone, but are supplemented by the common practice of three-generation households, enforced by housing shortages. More critical are the facilities for those without families. Bulgaria has programs to provide food, housing and medicine, but the program in 1980 covered only 5000 persons of the over 1 million persons above age 65 [RFE-RL, sr/17, December 9, 1982]. Hungary has publicly noted the lack of material assistance for the elderly and the consequent high suicide rate in this group [RFE-RL, sr/0010, June 23, 1982].

Prospects for improving the quality of life for adults are probably improving, as declining birth rates (in all but Poland) make their labor more valuable. By U.S. standards, the ages for retirement in Eastern Europe are relatively low: 55 years for women, 60 for men. As in the United States, retirement and pension policies might be changed to raise these ages and extend working life, but as far as I know, no changes are anticipated. Enlarging the labor force in the older age group would require substantial, long-term investments in health and human capital.

Human capital formation, the qualitative growth of the labor force, typically focuses on the young and their education, but other investments can also improve labor quality in all age groups. Anti-pollution programs mentioned above are life- and labor force-extending. Similarly, nutritional status plays an important role in maintaining health. Food programs in Eastern Europe have focused primarily on providing low cost carbohydrates and meat. These foods are appropriate for a young and vigorous population, but do not extend life in more sedentary adults, whose greater necessity is more fruits and vegetables, dietary specialties such as diabetic food, and fewer calories. Nutritional programs lag considerably. Romania has only recently introduced nutritional standards into its food planning. Bulgaria has a modest campaign to reduce sugar consumption. More seriously, the disruption of food supplies in Poland has increased the incidence of tuberculosis [RFE/RL, sr/0021, December 22, 1982].

Yet the greater need is not for meat and carbohydrates, however politically popular. The table below indicates that food consumption in Eastern Europe is quite adequate, if boring, by United States' standards.

TABLE 8.—DAILY PER CAPITA FOOD CONSUMPTION, 1977

| | Calories | Protein (grams) |
|---|---|---|
| Bulgaria | 3,578 | 105.1 |
| Czechoslovakia | 3,457 | 98.5 |
| German Democratic Republic | 3,644 | 99.9 |
| Hungary | 3,520 | 91.9 |
| Poland | 3,619 | 111.4 |
| Romania | 3,448 | 103.4 |
| United States | 3,578 | 106.4 |

Source: The World Factbook 1983, Central Intelligence Agency, Washington, D.C., 1983, pp. 31, 54, 79, 99, 181, 186, 232.

This indicates that the greater need for fruits, vegetables, and special dietary products affects both young and old, a need compromised not only by seasonal deficiencies but by rising restrictions on the imported foods that improve nutrition as well as add variety.

The third quality-of-life variable, for convenience named public order, is in fact a composite. It includes autonomy, or self-reliance, which is never wholly within reach of these small nations in this interdependent world. This is particularly true of resource dependency, which has been covered elsewhere [Clayton 1979, 133–154]. It includes human dignity: religious rights, the rights of ethnic minorities, and civil rights. And it includes the rights to travel and emigrate freely. Again these rights are difficult to quantify and to add to measures of welfare, but some estimates can be attempted. Measures of social deviance, such as suicide and crime rates, were investigated but found to have serious data deficiencies. [For further discussion of these measurement issues in another context see Young, Chapters 1,6.] Human dignity refers not to constitutional guarantees, which are found in all these nations, but to large-scale and state-directed repression of individuals. For this concept there are both direct evidence, such as political prisoners and censorship, and indirect evidence, such as the overwhelming desire to emigrate. Within the Eastern European bloc is found diversity of some range, and comparisons can be made between these states on indicators of domestic order and pressures to emigrate.

The evidence of repression of human dignity is diverse. Within countries, the number of political prisoners is available from various international groups; a small percentage usually is for illegal attempts at emigration. The GDR has the most: 4000–5000; Bulgaria has 250; Czechoslovakia 100, and Hungary only 50. No estimates are available for Poland or Romania [Committees on Foreign Affairs and Foreign Relations of the U.S. House of Representatives and Senate, respectively, Country Reports on Human Rights Practices for 1981, Washington D.C. GPO, 1982, p. 728–737, 750–758, 772–781, 794–802, 834–849, 856–863]. No Eastern European country has recorded disappearances of political dissidents, and all but Bulgaria have active dissident movements. [Ibid.] Religious worship is actively discouraged, but selectively allowed; in Romania, fourteen faiths are officially recognized but the Uniate (Eastern-rite Catholic) is not. Bulgaria allows the Bulgarian Orthodox church but, according to Amnesty International, imprisons Moslems for their faith, and it outlaws the Seventh Day Adventists. [RFE/RL, sr/0016, November 3, 1982]. Poland allows the Roman Catholic church, but displays bigotry toward Jews and Moslems. Foreign radio broadcasts are also discouraged, but selectively allowed: the GDR and Hungary jam no broadcasts; Czechoslovakia and Poland jam Radio Liberty but allow Voice of America [Country reports].

Rights to travel between and within Eastern European nations are abrogated less by politics than by economics. Political barriers are not absent, but are unrestrictive compared to barriers against travel in the west. Bulgaria and Hungary require domestic passports and the GDR has closed visits to Poland. Travel within the bloc is hampered by recent increases in ticket prices, particularly by rail. Travel to the west is severely and politically restricted: visits for purposes of business and, occasionally, family have not been wholly abrogated, but for leisure are virtually stopped.

Emigration restrictions are more complicated and may be divided into emigration for purposes both economic and political. Economic emigration, when emigrants want to raise their standard of living, is problematic for a sending country that has publicly financed human capital investments in the emigrants. Romania resolves this problem by requiring hard currency in the amount of the investment, as much as $20,000–25,000 for highly skilled or professional workers. Most economic emigrants (Bulgaria, Czechoslovakia, GDR, Poland, Romania, but not Hungary) lose their citizenship upon emigration, but the economic emigrants are otherwise sharply distinguished from the political.

Political emigrants face a paradox in motivation: their life goals are inextricably tied to their presence in their country, but repression and imprisonment prevent achieving those life goals. These people face fewer problems finding recipient countries than the economic emigrants; the United States alone will allow 12,000 entrants in FY 1984, mostly Polish. But political emigrants face the problem of forced emigration from their native country, whose fortunes are so inextricably tied to their own. Some citizens, not necessarily dissidents, are encouraged to emigrate for political reasons other than dissidence: until 1981 Poland encouraged worker migration to bring in hard currency; Bulgaria has volunteered the the exit of Turks and Jews. The paradox of all these political emigrants is that emigration is not a positive benefit, but a cost imposed upon them.

Measuring consumer welfare requires that both economic and political emigration be incorporated, the one positively and the other negatively. The right to emigrate for economic reasons ultimately depends on the willingness of a higher income country to recieve the emigrant; and pricing the emigration, as in Romania, is a transfer cost. The right to emigrate for political reasons is actually an obligation or cost imposed on the individual. For these reasons, human dignity indicators in measuring welfare is better reflected in other measures than emigration.

## V. CONCLUSIONS

In comparison to capitalistic economies, the socialist East European ecnomies are more egalitarian, both in intent and policy, and more fully employed. Both policies confer benefits to the citizenry but both are costly. Egalitarian policies hamper work incentives and alienate more capable employees, who may then seek economic emigration, the better to capture the rewards to their capabilities. The widespread disease of alcoholism may further indicate the personal disincentive of this legal mandate. In addition, full employment policies quickly turn from the guarantee of employment to the obligation to work. This obligation is opposed by both the International Labor Organization (convention #105) and the International Pact of Civil and Political Rights (Article 8). Poland is a signatory to both, but recently has introduced a bill, its fourth in fourteen years, obligating people to work.

In comparing the Eastern European countries to one another, the table below compares the rank of ordinary per capita GNP and standard of living to the ranks of supplemental measures developed earlier in this paper. On each supplemental measure, countries are ordered from 6 (high) to 1 (low). Countries are not in alphabetical order, but in order of Gross National Product per capita.

TABLE 9.—AUGMENTED STANDARD OF LIVING INDICATORS, EASTERN EUROPE, 1980'S

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| GDR | 1 | 3 | 2 | 2 | 6 | 2 | 1 | 1 | 1 | 4 |
| Czecholosvakia | 2 | 2 | 4 | 1 | 4 | 3 | 2 | 2 | 5 | 2 |
| Hungary | 3 | 5 | 1 | 3 | 6 | 1 | 5 | 4 | 4 | 1 |
| Poland | 4 | 1 | 4 | 5 | 4 | 3 | 4 | 2 | 3 | NA |
| Romania | 5 | 6 | 6 | 6 | 1 | 6 | 6 | 4 | 6 | NA |
| Bulgaria | 6 | 4 | 3 | 3 | 2 | 5 | 3 | NA | 3 | 3 |

NA denotes not available.

Sources and column titles:

(1) Gross National Product per capita (1981 in 1980 dollars), CIA, "The World Factbook 1983," Washington, D.C., GPO, 1983, pp. 30, 54, 78, 98, 180, 185.

(2) Standard of living per capita (1982 in 1970 prices, divided by 1982 population and valued at the conversion rates from the source in (1) above), Thad Alton, et al., "Money Income of the population and standard of living in Eastern Europe 1970–82," OP–78, L.W. International Financial Research Inc., New York, 1983.

(3) Share of social consumption in total consumption, Table 1, infra.

(4) Telephones per 100 population, Table 2, infra.

(5) Age-adjusted population, Table 4, infra.

(6) Housing subsidy, text, infra.

(7) Infant mortality 1980, Table 7, infra.

(8) Life expectancy at birth, Statistical Abstract of the United States 1981, Washington, D.C., p. 871–2.

(9) Calories per capita per day, Table 8, infra.

(10) Political prisoners, text infra.

The results of this table can be summarized as follows:

(1) The extent to which economic achievements are passed on to consumers is shown by the difference between GNP and standard of living per capita (column 1 minus column 2). The GDR and Hungary, with high GNP per capita are less likely to pass on these accomplishments than Bulgaria and Poland, whose per capita GNP is lower.

(2) The better-off nations (GDR, Czechoslovakia, and Hungary) are more likely to expand consumption through the social funds of consumption than are poorer nations, with the exception of Bulgaria. This scant evidence indicates that consumer sovereignty is unlikely to accompany a stronger economy.

(3) Older populations tend to have higher GNP per capita, probably due to greater labor force participation and lower commitment to increasing human capital. These nations also have lower birth rates.

(4) With the exception of Hungary, higher life expectancy and lower infant mortality are correlated with better material well-being. Romania's high infant mortality is accompanied by a high birth rate.

(5) The little evidence that we have on political repression (the number of political prisoners) suggests that it is unrelated to economic indicators—material well-being may encourage repression (GDR) or not (Hungary).

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# POPULATION ESTIMATES AND PROJECTIONS FOR EASTERN EUROPE: 1950-2000

By Godfrey Baldwin*

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## I. INTRODUCTION

This paper presents population projections by age and sex for the eight Communist countries of Eastern Europe—Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, and Yugoslavia. Population trends are described very briefly in the first section of the text. The sources, methods, and assumptions employed in making the projections are discussed in the second section. The text tables present the results of the projections in summary form, some derivative data, and figures relating to the fertility and mortality assumptions. Detailed results for the eight countries combined and for each country individually are given in the appendix tables. Table I gives total population on January 1, and July 1, absolute numbers of births, deaths, and natural increase, and the corresponding rates per 1,000 population for every fifth year of the period 1950 to 2000 and for each year of the period 1975 to 1985. Table II shows the projected distribution of the population by sex in 5-year age groups for every fifth year of the period 1980 to 2000. The numbers of persons by sex in the pre-school, primary school, working, and retirement ages for every fifth year of the period 1980 to 2000 are given in tables III, IV, V, and VI, respectively.[1]

## II. POPULATION TRENDS, 1950 TO 2000

The following discussion of population trends in Eastern Europe is very brief. More detailed discussions are given in earlier articles and reports by the U.S. Bureau of the Census.[2] This section will highlight the population trends and the changes in the current projections compared to those presented previously. The population of the eight countries of Eastern Europe increased by 28 million between 1950 and 1980. This represents an average annual growth rate of 0.8 percent (table 1). The rate declined during the fifties and early sixties but it hasn't changed very much since the mid-sixties. Most of the earlier decline was due to a decline in the birth rate. For the region as a whole, the birth rate dropped from about 26 births per 1,000 population in 1950 to 17 per 1,000 in 1965 (table 2). After 1965 the rate increased slightly to 18 per 1,000 in the mid 1970s and then declined slightly to 16 per 1,000 in the early 1980s. This relatively stable rate is in contrast to the generally falling birth rates in much of Europe after 1965. The higher rate in Eastern Europe has been due, in part, to programs designed to increase fertility which were instituted by the governments of several of these countries.

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[1] For this report these age groups are defined as follows: pre-school: ages 0-6 years, primary school: ages 7-14 years, working: ages 15-64 years, and retirement: ages 65 years and over. Actual definitions vary from country to country and in many cases differ from those given here.

The crude death rate for Eastern Europe declined from 12 deaths per 1,000 population in 1950 to 9 per 1,000 in the mid-sixties and then increased to almost 11 per 1,000 in 1980. The increase in the crude death rate has been due to the gradual aging of the population although the decline in the age-specific mortality rates has also been slower since the mid-sixties. The trend in the natural increase rate reflects the changes in both the birth rate and the death rate. The natural increase rate for Eastern Europe declined from 14 per 1,000 in 1950 to 8 in 1965, it remained around 7-9 per 1,000 until the late seventies, and then declined to 6 per 1,000 in the early eighties.

According to the projections presented in this report, the population of Eastern Europe is expected to number between 144 million and 151 million by the year 2000 (table 3). The principal determinant of the size of the future population will be the trend in fertility. Four fertility trends are postulated for the projections: high, medium, low, and constant. The amount of population growth expected during the period 1980-2000 is about the same for the medium and constant series. They show absolute increases of 13 and 14 million, respectively, and both indicate an average annual rate of 0.5 percent for the 20-year period. The high series implies an absolute increase of almost 17 million and an average annual rate of 0.6 percent, whereas the low series postulates an increase of only 10 million and an average rate of only 0.4 percent yearly.

Since migration after 1982 is assumed to be nil for each country, the projected growth rate for any particular year is simply the difference between the corresponding birth and death rates. The birth, death, and natural increase rates implied by the projections for 1983, 1990, and 2000 are shown in table 4. The crude birth rate is expected to remain around 16-17 per 1,000 for the high series, decline slightly to around 14-15 per 1,000 for the medium and constant series, and decline to below 13 per 1,000 for the low series.

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[2] The most recent published projections for these countries by the U.S. Bureau of the Census were presented in Godfrey Baldwin, "Population Estimates and Projections for Eastern Europe: 1950-2000," in U.S. Congress, Joint Economic Committee, "East European Economic Assessment," Washington, D.C., U.S. Government Printing Office, 1981.

The crude death rate for all four series is expected to remain near 10-11 per 1,000 throughout the projection period. These trends result in a slightly declining rate of natural increase for the high series, moderately declining rates for the medium and constant series, and a significantly declining rate for the low series.

The growth rates for most of the eight countries were low to moderate (i.e., 0.5 to 1.2 percent) during the 1950-80 period (table 1). Albania and the German Democratic Republic were the exceptions. Albania's average annual rate of 2.6 percent was more than double that of any of the other countries. The higher rate for Albania was due to a much higher birth rate. Even though the level of fertility has declined in Albania during the last 30 years it is still considerably higher than in the other countries. The German Democratic Republic was the only country among the eight to have a smaller population in 1980 than in 1950—due primarily to emigration, which was enormous prior to the building of the Berlin Wall in 1961. Since 1950, all of the countries except Albania have experienced at least one period of significant net emigration, but the German Democratic Republic was the only country where migration was the most important factor in population change. Net emigration from that country between 1950 and 1980 amounted to around 2.6 million persons, or more than 14 percent of the 1950 population. The German Democratic Republic and Hungary were the only countries to experience a natural decrease during any year after 1950. For the German Democratic Republic the number of deaths exceeded the number of births for every year from 1969 through 1978. The number of births has increased during recent years and has been greater than the number of deaths each year since 1978. The number of births in Hungary has declined since the mid-seventies and has been less than the number of deaths since 1981.

The future population trends for the individual countries vary considerably depending on the assumed level of fertility and on the age-sex structure. Albania is expected to have by far the largest relative growth. The medium series projection for that country indicates an average annual growth rate of 1.8 percent between 1980 and 2000, compared to 0.7 percent for Poland, the country with the next highest rate (table 3). The medium series rates for the remaining countries vary from −0.1 percent for Hungary to 0.6 percent for Romania. In the other series all of the projected rates for the period 1980-2000 except those for Albania are between −0.2 percent and 0.8 percent. The rates for Albania range from 1.7 to 2.2 percent.

The current projections for these countries are generally lower than the previously published projections prepared by the U.S. Bureau of the Census. For most of these countries recent fertility levels have been lower than those at the time the earlier projections were prepared. This and the lower fertility levels assumed for the long-term resulted in smaller population totals for the new projections. For Eastern Europe as a whole the total population for the medium series is 3.2 million or 2.1 percent lower at the end of the century, the total for the high series is 4.9 million or 3.2 percent lower, the figure for the constant series is 2.9 million or 1.9 percent lower, and the total for the low series is 1.3 million or 0.9 percent lower. For the individual countries all of the projected totals for the year 2000 are lower except those for the constant and low series for Poland. For Poland the assumed fertility levels for the near future are higher due to recent fertility increases, therefore the implied numbers of births during the eighties are also higher than those from the previous projections. For the medium and high series the assumed fertility levels projected for the end of the century are sufficiently lower than those from the previous projections to more than offset the higher fertility levels in the 1980s, and as a result, the projected population totals in the year 2000 are lower. For the other countries, the levels of fertility are lower throughout the projection period and consequently the projected population totals are also lower.

Selected age-sex characteristics in 1950, 1975 and 2000 are presented in table 5. The age distributions for the latter year vary according to the projection series because the size of the total population and especially the size of the under 15 age group are strongly dependent upon the projected level of fertility. The higher the level of fertility the higher the proportion of young people and the lower the proportion of old people. Albania, which stands out from the other countries in this respect, has a much younger population, as is clearly reflected in the percentage distributions by major age groups and in the median ages.

## III. SOURCES, METHODS, AND ASSUMPTIONS

The projections presented here supersede all others for these countries prepared previously by the U.S. Bureau of the Census. The data incorporated in these projections are for the most part those that were available as of March 1984, but some later information has been used. The cohort-component method was used in making the projections. This method involves carrying forward a reported or estimated age-sex distribution on the basis of various assumptions concerning the components of population change (i.e., fertility, mortality, and migration). For all of the countries migration was assumed to be nil during the projection period.

Whenever possible, official age-sex distributions were used for the base population, but for some countries it was necessary to use estimated or adjusted distributions. The January 1, 1972, base population for Albania was derived from data reported for earlier years, including census data for 1955 and 1960. For Bulgaria, the population by single years of age and sex reported for January 1, 1971 was updated to January 1, 1982 and adjusted to accord with the population by 5-year age groups and sex reported for the latter date. For Yugoslavia, the base population was an estimated distribution by single years of age for March 31, 1981 that was derived from the distribution by 5-year age groups reported for the March 31, 1981 census and the distribution by single years of age reported for July 1, 1979. The base population for Romania was the distribution by single years of age reported for July 1, 1981. For the other countries official distributions by single years of age for January 1, 1982 were used as the base populations. For each country, the base population was survived to January 1, 1983 using reported and estimated data on fertility, mortality, migration, and total population for the intervening years.

Four series of projections incorporating alternate fertility assumptions were prepared for each country. The constant series assumes that fertility will remain at the estimated 1982 level throughout the projection period. The other three series were designed to give a reasonable range of possible future trends in fertility. The assumptions for each series were formulated in terms of gross reproduction rates.[3] The rates assumed for 1983 and 2000 are given in table 6; the rates for the intervening years were obtained by linear interpolation. For each country, recently reported or estimated female age-specific fertility rates were adjusted to yield the number of births for 1982. For each series and each year these 1982 age-specific fertility rates were adjusted proportionally to the level of the assumed gross reproduction rates.

The anticipated fertility levels are related to the estimated gross reproduction rates for 1982. For example, the estimated 1982 rate for Albania, 1.77, was very high; consequently, all of the series except the constant series postulate a decline in the gross reproduction rate by the end of the century. On the other hand, the 1982 rate for Hungary, 0.88, was low; therefore, increases are assumed for the high and medium series and only a slight decline is assumed for the low series. The 1982 rates for the other six countries were between the rates for Hungary and Albania, and the assumed changes in the gross reproduction rate are also intermediate between the two extremes.

For all of the countries except Albania, the gross reproduction rate was assumed to reach a level of 1.12 for the high series, 0.97 for the medium series, and 0.83 for the low series by the end of the century. These assumed gross reproduction rates are equivalent to total fertility rates of 2.3, 2.0, and 1.7 births per woman.[4] The assumed level for the high series is the same as the 1982 level for Poland, the level for the low series is a little lower than the 1982 level for Hungary, and the assumed level for the medium series is such that, given the low mortality levels, it would eventually result in a slow rate of population decline if it continued for an extended length of time. The assumed gross reproduction rates for Albania were 1.27, 1.12, and 0.97; and the equivalent total fertility rates were 2.6, 2.3, and 2.0.

Only one assumption was made about the future course of mortality, namely that it will decrease slowly throughout the projection period. It was arbitrarily assumed that the decline in mortality would be equivalent to an increase of approximately 1.6 years in life expectancy at birth between 1982 and 2000. The rate of increase is almost 0.1 year per year, and if it continued until the year 2025, it would produce an overall increase of 4.0 years in life expectancy.[5] This assumption would appear to be reasonable, given the current levels of life expectancy in these countries.

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[3] The gross reproduction rate is defined as the number of daughters that would be born to a woman during her reproductive lifetime if a given set of birth rates by age of mother remains in effect.

[4] The total fertility rate is the number of children a woman would have in a lifetime if she were to experience the same fertility rates year by year that were experienced by all women in a given year.

The life table survival rates used for the projections were based on estimated 1982 survival rates calculated from official mortality data and on the relative changes implied between appropriate levels of model life tables prepared by Coale and Demeny.[6] The tables are divided into four families, each representing a different pattern of age-specific mortality, based on the mortality experience of various counties of the world. For present purposes, the families selected were those that most closely matched estimated 1982 survival rates by age for each sex. The rates for 1982 were estimated by adjusting survival rates, derived from reported mortality data by age and sex, to yield the number of deaths for 1982.

The survival rates for the year 2000 were calculated by modifying the estimated 1982 survival rates according to the changes implied between appropriate levels of the model life tables (i.e., levels with life expectancies at birth equal to those estimated for 1982 and those assumed for the year 2000). The life expectancies associated with the survival rates for 1982 and 2000 are shown in table 7. The survival rates for the intervening years were calculated by interpolating between the survival rates for 1982 and those for 2000. These rates were used to calculate the numbers of survivors by age and sex for each year in the projection period.

TABLE 1.—TOTAL POPULATION AND AVERAGE ANNUAL GROWTH RATES—8 EASTERN EUROPEAN COUNTRIES: 1950-80

[Absolute numbers in thousands as of Jan. 1; figures may not add to totals due to rounding]

| Country | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 |
|---|---|---|---|---|---|---|---|
| Eastern Europe | 105,504 | 111,081 | 116,105 | 120,690 | 125,105 | 129,387 | 133,932 |
| Albania | 1,199 | 1,359 | 1,581 | 1,841 | 2,105 | 2,375 | 2,644 |
| Bulgaria | 7,228 | 7,461 | 7,829 | 8,178 | 8,464 | 8,710 | 8,846 |
| Czechoslovakia | 12,340 | 13,024 | 13,608 | [1] 14,097 | [1] 14,309 | [1] 14,715 | [1] 15,227 |
| German Democratic Republic | [2] 18,388 | [1] 17,929 | [1] 17,114 | 17,004 | 17,075 | 16,891 | 16,740 |
| Hungary | 9,293 | 9,767 | 9,961 | 10,140 | 10,322 | 10,501 | 10,709 |
| Poland | 24,613 | [1] 26,959 | [1] 29,384 | [1] 31,123 | [1] 32,400 | [1] 33,805 | 35,413 |
| Romania | 16,204 | 17,181 | 18,319 | 18,980 | 20,140 | 21,141 | 22,133 |
| Yugoslavia | 16,240 | 17,402 | 18,308 | 19,328 | 20,290 | [1] 21,249 | [1] 22,218 |

| Country | Average annual growth rate | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1950-55 | 1955-60 | 1960-65 | 1965-70 | 1970-75 | 1975-80 | 1950-80 |
| Eastern Europe | 1.0 | 0.9 | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 |
| Albania | 2.5 | 3.0 | 3.0 | 2.7 | 2.4 | 2.1 | 2.6 |
| Bulgaria | .6 | 1.0 | .9 | .7 | .6 | .3 | .7 |
| Czechoslovakia | 1.1 | .9 | .7 | .3 | .6 | .7 | .7 |
| German Democratic Republic | -.5 | -.9 | -.1 | .1 | -.2 | -.2 | -.3 |

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[5] For females in Poland the overall increase would be only 3.3 years (and only 1.3 years between 1982 and 2000), since an increase of 4.0 years would exceed the upper limit for female life expectancy which was arbitrarily assumed to be 80 years.

[6] Ansley J. Coale and Paul Demeny, "Regional Model Life Tables and Stable Populations," Princeton, N.J., Princeton University Press, 1966.

## TABLE 1.—TOTAL POPULATION AND AVERAGE ANNUAL GROWTH RATES—8 EASTERN EUROPEAN COUNTRIES: 1950–80—Continued

| Country | Average annual growth rate | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1950–55 | 1955–60 | 1960–65 | 1965–70 | 1970–75 | 1975–80 | 1950–80 |
| Hungary | 1.0 | .4 | .4 | .4 | .3 | .4 | .5 |
| Poland | 1.8 | 1.7 | 1.1 | .8 | .8 | .9 | 1.2 |
| Romania | 1.2 | 1.3 | .7 | 1.2 | 1.0 | .9 | 1.0 |
| Yugoslavia | 1.4 | 1.0 | 1.1 | 1.0 | 0.9 | .9 | 1.0 |

[1] Revised estimates to account for discrepancies between the official estimates and census results. See notes to tables I–D, I–E, I–G, and I–I.
[2] Census of Aug. 31, 1950.

## TABLE 2.—VITAL RATES—8 EASTERN EUROPEAN COUNTRIES: 1950–82

[Rates per thousand population]

| Rate and year | Eastern Europe | Albania | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Yugoslavia |
|---|---|---|---|---|---|---|---|---|---|
| Birth: | | | | | | | | | |
| 1950 | 25.5 | 38.9 | 25.2 | 23.3 | 16.5 | 20.9 | 30.7 | 26.2 | 30.2 |
| 1955 | 24.1 | 44.5 | 20.1 | 20.3 | 16.4 | 21.4 | 29.2 | 25.6 | 26.9 |
| 1960 | 19.9 | 43.4 | 17.8 | 15.9 | 17.2 | 14.7 | 22.6 | 19.1 | 23.5 |
| 1965 | 17.1 | 35.2 | 15.3 | 16.4 | 16.5 | 13.1 | 17.5 | 14.6 | 21.0 |
| 1970 | 17.2 | 32.5 | 16.3 | 16.0 | 13.9 | 14.7 | 16.8 | 21.1 | 17.8 |
| 1975 | [1]17.9 | [1]29.3 | 16.6 | 19.6 | 10.8 | 18.4 | 19.0 | 19.7 | 18.2 |
| 1980 | [1]17.2 | [1]26.4 | 14.5 | 16.3 | 14.6 | 13.9 | 19.5 | 18.0 | 17.1 |
| 1981 | [1]16.6 | [1]27.1 | 14.0 | 15.5 | 14.2 | 13.3 | 18.9 | 17.0 | 16.4 |
| 1982 | 16.4 | 27.8 | 13.9 | 15.2 | 14.4 | 12.5 | 19.4 | 15.3 | 16.5 |
| Death: | | | | | | | | | |
| 1950 | 11.9 | 14.2 | 10.2 | 11.5 | 11.9 | 11.4 | 11.6 | 12.4 | 13.0 |
| 1955 | 10.3 | 15.1 | 9.0 | 9.6 | 12.0 | 10.0 | 9.6 | 9.7 | 11.4 |
| 1960 | 9.5 | 10.4 | 8.1 | 9.2 | 13.7 | 10.2 | 7.6 | 8.7 | 9.9 |
| 1965 | 9.3 | 9.0 | 8.1 | 10.0 | 13.5 | 10.7 | 7.4 | 8.6 | 8.8 |
| 1970 | 10.1 | 9.3 | 9.1 | 11.6 | 14.1 | 11.6 | 8.2 | 9.5 | 8.9 |
| 1975 | [1]10.2 | [1]7.2 | 10.3 | 11.5 | 14.3 | 12.4 | 8.7 | 9.3 | 8.7 |
| 1980 | 10.9 | 6.4 | 11.1 | 12.2 | 14.2 | 13.6 | 9.8 | 10.4 | 8.8 |
| 1981 | [1]10.5 | [1]6.5 | 10.7 | 11.8 | 13.9 | 13.5 | 9.2 | 10.0 | 9.0 |
| 1982 | [1]10.5 | [1]6.5 | 11.2 | 11.8 | 13.7 | 13.5 | 9.2 | 10.0 | 8.9 |
| Natural increase: | | | | | | | | | |
| 1950 | 13.6 | 24.7 | 15.0 | 11.8 | 4.6 | 9.5 | 19.1 | 13.8 | 17.3 |
| 1955 | 13.7 | 29.4 | 11.1 | 10.7 | 4.4 | 11.4 | 19.6 | 15.9 | 15.5 |
| 1960 | 10.4 | 32.9 | 9.7 | 6.7 | 3.5 | 4.5 | 15.0 | 10.4 | 13.6 |
| 1965 | 7.8 | 26.2 | 7.2 | 6.4 | 3.0 | 2.4 | 10.0 | 6.0 | 12.2 |
| 1970 | 7.1 | 23.3 | 7.2 | 4.4 | −.2 | 3.1 | 8.6 | 11.6 | 8.9 |
| 1975 | [1]7.7 | [1]22.1 | 6.3 | 8.1 | −3.5 | 6.0 | 10.2 | 10.4 | 9.5 |
| 1980 | [1]6.3 | [1]20.0 | 3.4 | 4.1 | .4 | .3 | 9.6 | 7.6 | 8.3 |
| 1981 | [1]6.1 | [1]20.7 | 3.3 | 3.8 | .3 | −.2 | 9.7 | 7.0 | 7.5 |
| 1982 | [1]5.9 | [1]21.3 | 2.7 | 3.5 | .7 | −1.0 | 10.1 | 5.3 | 7.6 |

[1] Estimated.

## TABLE 3.—ESTIMATED AND PROJECTED TOTAL POPULATION AND AVERAGE ANNUAL GROWTH RATES—8 EASTERN EUROPEAN COUNTRIES: 1980–2000

[Absolute numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Country and series | 1980 | 1985 | 1990 | 1995 | 2000 | Average annual growth rate | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1980–85 | 1985–90 | 1990–95 | 1995–2000 | 1980–2000 |
| Eastern Europe: | | | | | | | | | | |
| High | 133,932 | 137,951 | 142,098 | 146,373 | 150,698 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Medium | | 137,722 | 141,102 | 144,317 | 147,248 | .6 | .5 | .5 | .4 | .5 |
| Low | | 137,494 | 140,130 | 142,338 | 143,960 | .5 | .4 | .3 | .2 | .4 |
| Constant | | 137,733 | 141,275 | 144,854 | 148,381 | .6 | .5 | .5 | .5 | .5 |
| Albania: | | | | | | | | | | |
| High | 2,644 | 2,942 | 3,269 | 3,595 | 3,898 | 2.1 | 2.1 | 1.9 | 1.6 | 1.9 |
| Medium | | 2,934 | 3,237 | 3,531 | 3,793 | 2.1 | 2.0 | 1.7 | 1.4 | 1.8 |
| Low | | 2,926 | 3,205 | 3,466 | 3,688 | 2.0 | 1.8 | 1.6 | 1.2 | 1.7 |
| Constant | | 2,938 | 3,285 | 3,676 | 4,094 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 |
| Bulgaria: | | | | | | | | | | |
| High | 8,846 | 8,983 | 9,115 | 9,283 | 9,464 | .3 | .3 | .4 | .4 | .3 |
| Medium | | 8,970 | 9,060 | 9,163 | 9,258 | .3 | .2 | .2 | .2 | .2 |
| Low | | 8,958 | 9,005 | 9,048 | 9,062 | .3 | .1 | .1 | .0 | .1 |
| Constant | | 8,970 | 9,053 | 9,144 | 9,217 | .3 | .2 | .2 | .2 | .2 |
| Czechoslovakia: | | | | | | | | | | |
| High | [1] 15,227 | 15,519 | 15,813 | 16,186 | 16,681 | .4 | .4 | .5 | .6 | .5 |
| Medium | | 15,495 | 15,708 | 15,964 | 16,296 | .3 | .3 | .3 | .4 | .3 |
| Low | | 15,471 | 15,606 | 15,752 | 15,929 | .3 | .2 | .2 | .2 | .2 |
| Constant | | 15,496 | 15,720 | 16,004 | 16,383 | .4 | .3 | .4 | .5 | .4 |
| German Democratic Republic: | | | | | | | | | | |
| High | 16,740 | 16,764 | 16,980 | 17,205 | 17,381 | .0 | .3 | .3 | .2 | .2 |
| Medium | | 16,738 | 16,864 | 16,972 | 17,009 | −.0 | .1 | .1 | .0 | .1 |
| Low | | 16,713 | 16,750 | 16,748 | 16,665 | −.0 | .0 | −.0 | −.1 | −.0 |
| Constant | | 16,737 | 16,840 | 16,904 | 16,878 | −.0 | .1 | .1 | −.0 | .0 |
| Hungary: | | | | | | | | | | |
| High | 10,709 | 10,684 | 10,646 | 10,692 | 10,825 | −.0 | −.1 | .1 | .2 | .1 |
| Medium | | 10,670 | 10,585 | 10,559 | 10,592 | −.1 | −.2 | −.0 | .1 | −.1 |
| Low | | 10,657 | 10,525 | 10,432 | 10,370 | −.1 | −.2 | −.2 | −.1 | −.2 |
| Constant | | 10,669 | 10,568 | 10,507 | 10,479 | −.1 | −.2 | −.1 | −.1 | −.1 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poland: | | | | | | | | | | |
| High | 35,413 | 37,162 | 38,782 | 40,156 | 41,492 | 1.0 | .9 | .7 | .7 | .8 |
| Medium | | 37,091 | 38,488 | 39,575 | 40,533 | .9 | .7 | .6 | .5 | .7 |
| Low | | 37,020 | 38,201 | 39,015 | 39,620 | .9 | .6 | .4 | .3 | .6 |
| Constant | | 37,096 | 38,595 | 39,900 | 41,213 | .9 | .8 | .7 | .6 | .8 |
| Romania: | | | | | | | | | | |
| High | 22,133 | 22,786 | 23,451 | 24,293 | 25,138 | .6 | .6 | .7 | .7 | .6 |
| Medium | | 22,751 | 23,292 | 23,948 | 24,546 | .6 | .5 | .6 | .5 | .5 |
| Low | | 22,716 | 23,138 | 23,616 | 23,983 | .5 | .4 | .4 | .3 | .4 |
| Constant | | 22,753 | 23,323 | 24,051 | 24,766 | .6 | .5 | .6 | .6 | .6 |
| Yugoslavia: | | | | | | | | | | |
| High | [1] 22,218 | 23,112 | 24,042 | 24,964 | 25,819 | .8 | .8 | .8 | .7 | .8 |
| Medium | | 23,073 | 23,869 | 24,605 | 25,221 | .8 | .7 | .6 | .5 | .6 |
| Low | | 23,034 | 23,700 | 24,260 | 24,652 | .7 | .6 | .5 | .3 | .5 |
| Constant | | 23,074 | 23,889 | 24,668 | 25,351 | .8 | .7 | .6 | .5 | .7 |

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[1] Revised estimates to account for discrepancies between the official estimates and census results. See notes to tables I–D and I–I.

## TABLE 4.—PROJECTED VITAL RATES—8 EASTERN EUROPEAN COUNTRIES: 1983, 1990, AND 2000

[Rates per thousand population; see text for an explanation of the series]

| Rate, series, and year | Eastern Europe | Albania | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Yugoslavia |
|---|---|---|---|---|---|---|---|---|---|
| Birth: | | | | | | | | | |
| High: | | | | | | | | | |
| 1983 | 17.0 | 29.0 | 13.8 | 15.8 | 15.2 | 12.8 | 19.9 | 15.8 | 17.3 |
| 1990 | 16.1 | 26.4 | 14.3 | 15.2 | 15.0 | 13.3 | 16.5 | 16.9 | 16.6 |
| 2000 | 16.2 | 20.4 | 15.5 | 17.1 | 14.0 | 16.1 | 16.1 | 17.0 | 16.0 |
| Medium: | | | | | | | | | |
| 1983 | 16.2 | 27.6 | 13.2 | 15.0 | 14.5 | 12.2 | 19.0 | 15.1 | 16.5 |
| 1990 | 14.9 | 24.7 | 13.2 | 14.0 | 13.8 | 12.2 | 15.3 | 15.6 | 15.4 |
| 2000 | 14.4 | 18.5 | 13.7 | 15.2 | 12.4 | 14.3 | 14.3 | 15.1 | 14.2 |
| Low: | | | | | | | | | |
| 1983 | 15.4 | 26.2 | 12.5 | 14.3 | 13.8 | 11.6 | 18.0 | 14.3 | 15.7 |
| 1990 | 13.7 | 23.1 | 12.1 | 12.9 | 12.6 | 11.2 | 14.1 | 14.3 | 14.1 |
| 2000 | 12.6 | 16.5 | 11.9 | 13.3 | 10.8 | 12.5 | 12.5 | 13.2 | 12.4 |
| Constant: | | | | | | | | | |
| 1983 | 16.2 | 28.2 | 13.2 | 15.0 | 14.5 | 12.2 | 19.0 | 15.1 | 16.5 |
| 1990 | 15.3 | 29.1 | 13.0 | 14.2 | 13.4 | 11.7 | 16.1 | 16.0 | 15.6 |
| 2000 | 15.3 | 27.0 | 13.2 | 15.8 | 11.8 | 13.0 | 16.3 | 16.1 | 14.8 |
| Death: | | | | | | | | | |
| High: | | | | | | | | | |
| 1983 | 10.5 | 6.6 | 10.8 | 11.7 | 13.5 | 13.5 | 9.3 | 10.0 | 9.0 |
| 1990 | 10.3 | 6.4 | 11.2 | 11.3 | 12.2 | 13.4 | 9.2 | 10.3 | 9.0 |
| 2000 | 10.5 | 6.2 | 11.9 | 11.0 | 11.5 | 13.3 | 9.7 | 10.7 | 9.8 |
| Medium: | | | | | | | | | |
| 1983 | 10.5 | 6.5 | 10.8 | 11.7 | 13.5 | 13.5 | 9.3 | 10.0 | 9.0 |
| 1990 | 10.4 | 6.4 | 11.2 | 11.3 | 12.3 | 13.4 | 9.2 | 10.3 | 9.0 |
| 2000 | 10.8 | 6.2 | 12.2 | 11.2 | 11.7 | 13.6 | 9.9 | 10.9 | 10.0 |
| Low: | | | | | | | | | |
| 1983 | 10.5 | 6.5 | 10.8 | 11.7 | 13.5 | 13.5 | 9.3 | 10.0 | 8.9 |
| 1990 | 10.4 | 6.3 | 11.3 | 11.4 | 12.3 | 13.5 | 9.3 | 10.3 | 9.1 |
| 2000 | 11.0 | 6.2 | 12.4 | 11.5 | 12.0 | 13.9 | 10.1 | 11.1 | 10.2 |
| Constant: | | | | | | | | | |
| 1983 | 10.5 | 6.5 | 10.8 | 11.7 | 13.5 | 13.5 | 9.3 | 10.0 | 9.0 |
| 1990 | 10.4 | 6.5 | 11.2 | 11.3 | 12.3 | 13.5 | 9.2 | 10.3 | 9.0 |
| 2000 | 10.7 | 6.3 | 12.2 | 11.2 | 11.8 | 13.7 | 9.7 | 10.8 | 10.0 |
| Natural increase: | | | | | | | | | |
| High: | | | | | | | | | |
| 1983 | 6.5 | 22.4 | 3.0 | 4.0 | 1.7 | −.7 | 10.6 | 5.8 | 8.3 |
| 1990 | 5.8 | 19.9 | 3.1 | 3.9 | 2.8 | −.1 | 7.3 | 6.6 | 7.6 |
| 2000 | 5.7 | 14.2 | 3.5 | 6.2 | 2.5 | 2.8 | 6.5 | 6.3 | 6.2 |
| Medium: | | | | | | | | | |
| 1983 | 5.7 | 21.1 | 2.4 | 3.3 | 1.0 | −1.3 | 9.7 | 5.1 | 7.5 |
| 1990 | 4.5 | 18.4 | 1.9 | 2.7 | 1.5 | −1.2 | 6.0 | 5.3 | 6.3 |
| 2000 | 3.6 | 12.3 | 1.5 | 4.0 | .7 | .7 | 4.5 | 4.2 | 4.2 |
| Low: | | | | | | | | | |
| 1983 | 4.9 | 19.8 | 1.7 | 2.6 | .2 | −1.9 | 8.8 | 4.3 | 6.7 |
| 1990 | 3.3 | 16.8 | .8 | 1.5 | .3 | −2.3 | 4.8 | 4.0 | 5.0 |
| 2000 | 1.6 | 10.3 | −.5 | 1.8 | −1.1 | −1.4 | 2.5 | 2.1 | 2.2 |
| Constant: | | | | | | | | | |
| 1983 | 5.7 | 21.6 | 2.4 | 3.3 | 1.0 | −1.3 | 9.7 | 5.1 | 7.5 |
| 1990 | 4.9 | 22.5 | 1.7 | 2.9 | 1.1 | −1.7 | 6.9 | 5.7 | 6.6 |
| 2000 | 4.6 | 20.6 | .9 | 4.7 | −.3 | −.7 | 6.6 | 5.3 | 4.8 |

## TABLE 5.—SELECTED AGE-SEX CHARACTERISTICS OF THE POPULATION—8 EASTERN EUROPEAN COUNTRIES: 1950, 1975, AND 2000

[As of July 1 for 1950, Jan. 1 for 1975 and 2000; percentages may not add to totals due to rounding, see text for explanation of the series]

| Country, year, and series | Percent distribution by age group | | | | | Median age (in years) | Males per 100 females | Dependency ratio [1] |
|---|---|---|---|---|---|---|---|---|
| | All ages | 0–14 | 15–39 | 40–64 | 65 and over | | | |
| Eastern Europe: | | | | | | | | |
| 1950 | 100.0 | 27.5 | 38.1 | 27.5 | 6.8 | 27.9 | 90.8 | 523 |
| 1975 | 100.0 | 24.0 | 38.1 | 27.2 | 10.7 | 30.8 | 94.8 | 532 |
| 2000: | | | | | | | | |
| High | 100.0 | 22.7 | 35.1 | 29.9 | 12.3 | 34.1 | 96.6 | 539 |
| Medium | 100.0 | 21.1 | 35.8 | 30.6 | 12.6 | 35.0 | 96.4 | 508 |
| Low | 100.0 | 19.4 | 36.4 | 31.3 | 12.9 | 35.8 | 96.2 | 477 |
| Constant | 100.0 | 21.7 | 35.5 | 30.3 | 12.5 | 34.7 | 96.4 | 519 |
| Albania: | | | | | | | | |
| 1950 | 100.0 | 39.3 | 36.8 | 17.8 | 6.1 | 20.3 | 106.6 | 831 |
| 1975 | 100.0 | 39.9 | 38.1 | 16.8 | 5.2 | 19.5 | 105.5 | 820 |
| 2000: | | | | | | | | |
| High | 100.0 | 30.8 | 41.3 | 21.8 | 6.1 | 26.0 | 104.1 | 586 |
| Medium | 100.0 | 29.1 | 42.2 | 22.4 | 6.3 | 26.8 | 104.1 | 548 |
| Low | 100.0 | 27.3 | 43.2 | 23.0 | 6.4 | 27.6 | 104.0 | 510 |
| Constant | 100.0 | 34.2 | 39.2 | 20.7 | 5.8 | 24.5 | 104.2 | 667 |
| Bulgaria: | | | | | | | | |
| 1950 | 100.0 | 26.8 | 41.7 | 24.8 | 6.7 | 27.3 | 99.9 | 504 |
| 1975 | 100.0 | 22.4 | 36.4 | 30.8 | 10.5 | 33.5 | 99.7 | 490 |
| 2000: | | | | | | | | |
| High | 100.0 | 21.1 | 33.4 | 30.5 | 15.0 | 36.6 | 98.1 | 566 |
| Medium | 100.0 | 19.5 | 34.0 | 31.2 | 15.3 | 37.4 | 97.9 | 535 |
| Low | 100.0 | 17.9 | 34.6 | 31.9 | 15.7 | 38.2 | 97.7 | 505 |
| Constant | 100.0 | 19.1 | 34.1 | 31.3 | 15.4 | 37.6 | 97.9 | 528 |
| Czechoslovakia: | | | | | | | | |
| 1950 | 100.0 | 25.9 | 36.6 | 29.9 | 7.6 | 30.2 | 94.6 | 504 |
| 1975 | 100.0 | 23.2 | 37.1 | 27.7 | 12.1 | 31.3 | 95.0 | 544 |
| 2000: | | | | | | | | |
| High | 100.0 | 22.7 | 35.4 | 30.1 | 11.9 | 33.7 | 95.3 | 528 |
| Medium | 100.0 | 21.0 | 36.1 | 30.8 | 12.1 | 34.6 | 95.1 | 496 |
| Low | 100.0 | 19.3 | 36.8 | 31.5 | 12.4 | 35.4 | 94.9 | 465 |
| Constant | 100.0 | 21.4 | 35.9 | 30.6 | 12.1 | 34.4 | 95.1 | 503 |
| German Democratic Republic: | | | | | | | | |
| 1950 | 100.0 | 22.8 | 31.0 | 35.6 | 10.6 | 37.3 | 79.8 | 502 |
| 1975 | 100.0 | 21.9 | 35.6 | 26.3 | 16.3 | 35.1 | 86.5 | 617 |
| 2000: | | | | | | | | |
| High | 100.0 | 21.0 | 33.8 | 31.8 | 13.4 | 37.0 | 94.7 | 523 |
| Medium | 100.0 | 19.4 | 34.4 | 32.5 | 13.7 | 37.7 | 94.5 | 494 |
| Low | 100.0 | 17.8 | 35.0 | 33.2 | 14.0 | 38.3 | 94.2 | 466 |
| Constant | 100.0 | 18.7 | 34.7 | 32.8 | 13.8 | 37.9 | 94.4 | 482 |
| Hungary: | | | | | | | | |
| 1950 | 100.0 | 25.1 | 38.6 | 29.0 | 7.3 | 29.9 | 92.6 | 480 |
| 1975 | 100.0 | 20.2 | 37.2 | 30.1 | 12.5 | 34.2 | 94.2 | 485 |
| 2000: | | | | | | | | |
| High | 100.0 | 20.6 | 33.5 | 32.1 | 13.7 | 36.5 | 93.4 | 524 |
| Medium | 100.0 | 19.0 | 34.1 | 32.8 | 14.0 | 37.4 | 93.2 | 494 |
| Low | 100.0 | 17.4 | 34.7 | 33.5 | 14.3 | 38.3 | 93.0 | 465 |
| Constant | 100.0 | 18.2 | 34.5 | 33.2 | 14.2 | 37.9 | 93.1 | 478 |
| Poland: | | | | | | | | |
| 1950 | 100.0 | 29.4 | 40.2 | 25.2 | 5.2 | 25.8 | 91.0 | 529 |
| 1975 | 100.0 | 24.1 | 40.2 | 26.3 | 9.3 | 28.2 | 94.7 | 503 |
| 2000: | | | | | | | | |
| High | 100.0 | 23.2 | 35.2 | 29.9 | 11.7 | 33.5 | 95.6 | 536 |
| Medium | 100.0 | 21.6 | 35.9 | 30.6 | 12.0 | 34.5 | 95.4 | 504 |
| Low | 100.0 | 19.9 | 36.6 | 31.3 | 12.2 | 35.4 | 95.2 | 474 |
| Constant | 100.0 | 22.8 | 35.3 | 30.1 | 11.8 | 33.8 | 95.6 | 529 |

## TABLE 5.—SELECTED AGE-SEX CHARACTERISTICS OF THE POPULATION—8 EASTERN EUROPEAN COUNTRIES: 1950, 1975, AND 2000—Continued

[As of July 1 for 1950, Jan. 1 for 1975 and 2000; percentages may not add to totals due to rounding; see text for explanation of the series]

| Country, year, and series | Percent distribution by age group: All ages | 0–14 | 15–39 | 40–64 | 65 and over | Median age (in years) | Males per 100 females | Dependency ratio [1] |
|---|---|---|---|---|---|---|---|---|
| Romania: | | | | | | | | |
| 1950 | 100.0 | 28.4 | 41.0 | 25.2 | 5.3 | 26.1 | 93.2 | 509 |
| 1975 | 100.0 | 25.2 | 37.4 | 28.0 | 9.4 | 30.8 | 96.9 | 529 |
| 2000: | | | | | | | | |
| High | 100.0 | 23.3 | 35.6 | 28.7 | 12.3 | 32.3 | 98.0 | 555 |
| Medium | 100.0 | 21.6 | 36.4 | 29.4 | 12.6 | 33.0 | 97.8 | 521 |
| Low | 100.0 | 19.9 | 37.1 | 30.1 | 12.9 | 34.0 | 97.6 | 489 |
| Constant | 100.0 | 22.3 | 36.1 | 29.1 | 12.5 | 32.7 | 97.9 | 535 |
| Yugoslavia: | | | | | | | | |
| 1950 | 100.0 | 31.1 | 39.7 | 23.5 | 5.7 | 24.1 | 93.1 | 582 |
| 1975 | 100.0 | 25.8 | 39.3 | 26.3 | 8.6 | 28.8 | 96.8 | 524 |
| 2000: | | | | | | | | |
| High | 100.0 | 22.9 | 35.4 | 29.6 | 12.1 | 34.1 | 98.5 | 539 |
| Medium | 100.0 | 21.3 | 36.1 | 30.3 | 12.4 | 34.9 | 98.3 | 507 |
| Low | 100.0 | 19.6 | 36.8 | 31.0 | 12.7 | 35.7 | 98.1 | 476 |
| Constant | 100.0 | 21.7 | 35.9 | 30.1 | 12.3 | 34.7 | 98.3 | 514 |

[1] Number of persons under 15 and 65 and over per thousand persons of age 15 to 65.

## TABLE 6.—ESTIMATED AND ASSUMED GROSS REPRODUCTION RATES—8 EASTERN EUROPEAN COUNTRIES: 1982, 1983 AND 2000

| Year and series | Albania | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Yugoslavia |
|---|---|---|---|---|---|---|---|---|
| 1982 | 1.77 | .93 | 1.02 | .90 | .88 | 1.12 | 1.05 | 1.02 |
| 1983: | | | | | | | | |
| High | 1.82 | .98 | 1.07 | .94 | .92 | 1.18 | 1.10 | 1.07 |
| Medium | 1.73 | .93 | 1.02 | .90 | .88 | 1.12 | 1.05 | 1.02 |
| Low | 1.64 | .88 | .96 | .85 | .83 | 1.07 | .99 | .96 |
| Constant | 1.77 | .93 | 1.02 | .90 | .88 | 1.12 | 1.05 | 1.02 |
| 2000: | | | | | | | | |
| High | 1.27 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| Medium | 1.12 | .97 | .97 | .97 | .97 | .97 | .97 | .97 |
| Low | .97 | .83 | .83 | .83 | .83 | .83 | .83 | .83 |
| Constant | 1.77 | .93 | 1.02 | .90 | .88 | 1.12 | 1.05 | 1.02 |

## TABLE 7.—LIFE EXPECTANCIES AT BIRTH, BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1982 AND 2000

| Country | 1982 (estimated) | | 2000 (projected) | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Albania | 67.6 | 72.8 | 69.2 | 74.4 |
| Bulgaria | 69.9 | 75.6 | 71.5 | 77.2 |
| Czechoslovakia | 67.3 | 75.4 | 69.0 | 77.0 |
| German Democratic Republic | 69.2 | 75.7 | 70.8 | 77.3 |
| Hungary | 65.7 | 73.8 | 67.4 | 75.4 |
| Poland | 67.9 | 76.7 | 69.5 | 78.0 |
| Romania | 67.8 | 73.3 | 69.4 | 74.9 |
| Yugoslavia | 68.6 | 74.7 | 70.2 | 76.3 |

## APPENDIX TABLES

### TABLE I-A.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—8 EASTERN EUROPEAN COUNTRIES COMBINED: 1950–2000

[Absolute numbers in thousands; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population |  | Natural increase |  | Births |  | Deaths |  |
|---|---|---|---|---|---|---|---|---|
|  | Jan. 1 | July 1 | Number | Rate | Number | Rate | Number | Rate |
| ESTIMATES |  |  |  |  |  |  |  |  |
| 1950 | 105,504 | 106,061 | 1,438 | 13.6 | 2,702 | 25.5 | 1,264 | 11.9 |
| 1955 | 111,081 | 111,692 | 1,533 | 13.7 | 2,689 | 24.1 | 1,156 | 10.3 |
| 1960 | 116,105 | 116,565 | 1,212 | 10.4 | 2,321 | 19.9 | 1,109 | 9.5 |
| 1965 | 120,690 | 121,110 | 941 | 7.8 | 2,070 | 17.1 | 1,129 | 9.3 |
| 1970 | 125,105 | 125,500 | 896 | 7.1 | 2,162 | 17.2 | 1,265 | 10.1 |
| 1975 | 129,387 | 129,838 | 1,003 | 7.7 | 2,330 | 17.9 | 1,328 | 10.2 |
| 1976 | 130,307 | 130,769 | 1,030 | 7.9 | 2,363 | 18.1 | 1,334 | 10.2 |
| 1977 | 131,265 | 131,738 | 1,019 | 7.7 | 2,366 | 18.0 | 1,347 | 10.2 |
| 1978 | 132,200 | 132,622 | 967 | 7.3 | 2,351 | 17.7 | 1,384 | 10.4 |
| 1979 | 133,043 | 133,505 | 964 | 7.2 | 2,352 | 17.6 | 1,387 | 10.4 |
| 1980 | 133,932 | 134,319 | 851 | 6.3 | 2,315 | 17.2 | 1,464 | 10.9 |
| 1981 | 134,723 | 135,111 | 821 | 6.1 | 2,245 | 16.6 | 1,425 | 10.5 |
| 1982 | 135,492 | 135,825 | 798 | 5.9 | 2,231 | 16.4 | 1,433 | 10.5 |
| PROJECTIONS |  |  |  |  |  |  |  |  |
| High series: |  |  |  |  |  |  |  |  |
| 1983 | 136,198 | 136,641 | 885 | 6.5 | 2,322 | 17.0 | 1,437 | 10.5 |
| 1984 | 137,083 | 137,517 | 868 | 6.3 | 2,315 | 16.8 | 1,448 | 10.5 |
| 1985 | 137,951 | 138,377 | 851 | 6.1 | 2,307 | 16.7 | 1,456 | 10.5 |
| 1990 | 142,098 | 142,512 | 827 | 5.8 | 2,295 | 16.1 | 1,468 | 10.3 |
| 1995 | 146,373 | 146,807 | 868 | 5.9 | 2,353 | 16.0 | 1,485 | 10.1 |
| 2000 | 150,698 | 151,126 | 855 | 5.7 | 2,448 | 16.2 | 1,592 | 10.5 |
| Medium series: |  |  |  |  |  |  |  |  |
| 1983 | 136,198 | 136,586 | 776 | 5.7 | 2,212 | 16.2 | 1,436 | 10.5 |
| 1984 | 136,974 | 137,348 | 748 | 5.4 | 2,193 | 16.0 | 1,445 | 10.5 |
| 1985 | 137,722 | 138,082 | 720 | 5.2 | 2,173 | 15.7 | 1,454 | 10.5 |
| 1990 | 141,102 | 141,421 | 639 | 4.5 | 2,103 | 14.9 | 1,464 | 10.4 |
| 1995 | 144,317 | 144,626 | 618 | 4.3 | 2,097 | 14.5 | 1,479 | 10.2 |
| 2000 | 147,248 | 147,515 | 533 | 3.6 | 2,119 | 14.4 | 1,586 | 10.8 |
| Low series: |  |  |  |  |  |  |  |  |
| 1983 | 136,198 | 136,532 | 667 | 4.9 | 2,101 | 15.4 | 1,434 | 10.5 |
| 1984 | 136,865 | 137,180 | 629 | 4.6 | 2,072 | 15.1 | 1,443 | 10.5 |
| 1985 | 137,494 | 137,790 | 591 | 4.3 | 2,042 | 14.8 | 1,451 | 10.5 |
| 1990 | 140,130 | 140,360 | 459 | 3.3 | 1,920 | 13.7 | 1,460 | 10.4 |
| 1995 | 142,338 | 142,528 | 381 | 2.7 | 1,856 | 13.0 | 1,474 | 10.3 |
| 2000 | 143,960 | 144,076 | 232 | 1.6 | 1,812 | 12.6 | 1,580 | 11.0 |
| Constant series: |  |  |  |  |  |  |  |  |
| 1983 | 136,198 | 136,587 | 777 | 5.7 | 2,213 | 16.2 | 1,436 | 10.5 |
| 1984 | 136,976 | 137,354 | 757 | 5.5 | 2,203 | 16.0 | 1,446 | 10.5 |
| 1985 | 137,733 | 138,101 | 737 | 5.3 | 2,191 | 15.9 | 1,454 | 10.5 |
| 1990 | 141,275 | 141,622 | 695 | 4.9 | 2,161 | 15.3 | 1,466 | 10.4 |
| 1995 | 144,854 | 145,212 | 717 | 4.9 | 2,200 | 15.2 | 1,483 | 10.2 |
| 2000 | 148,381 | 148,722 | 682 | 4.6 | 2,272 | 15.3 | 1,590 | 10.7 |

## TABLE I-B.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—ALBANIA: 1950–2000

[Absolute numbers in thousand; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate | Number | Rate | Number | Rate |
| ESTIMATES | | | | | | | | |
| 1950 | 1,199 | 1,215 | 30 | 24.7 | 47 | 38.9 | 17 | 14.2 |
| 1955 | 1,359 | 1,379 | 41 | 29.4 | 61 | 44.5 | 21 | 15.1 |
| 1960 | 1,581 | 1,607 | 53 | 32.9 | 70 | 43.4 | 17 | 10.4 |
| 1965 | 1,841 | 1,865 | 49 | 26.2 | 66 | 35.2 | 17 | 9.0 |
| 1970 | 2,105 | 2,136 | 50 | 23.3 | 70 | 32.5 | 20 | 9.3 |
| 1975 | 2,375 | 2,402 | 53 | 22.1 | 70 | 29.3 | 17 | 7.2 |
| 1976 | 2,428 | 2,455 | 54 | 21.9 | 71 | 28.7 | 17 | 6.9 |
| 1977 | 2,482 | 2,509 | 54 | 21.6 | 71 | 28.2 | 16 | 6.6 |
| 1978 | 2,536 | 2,563 | 54 | 21.2 | 71 | 27.5 | 16 | 6.3 |
| 1979 | 2,591 | 2,617 | 54 | 20.5 | 71 | 27.0 | 17 | 6.4 |
| 1980 | 2,644 | 2,671 | 53 | 20.0 | 70 | 26.4 | 17 | 6.4 |
| 1981 | 2,698 | 2,726 | 56 | 20.7 | 74 | 27.1 | 18 | 6.5 |
| 1982 | 2,754 | 2,784 | 59 | 21.3 | 77 | 27.8 | 18 | 6.5 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 2,813 | 2,845 | 64 | 22.4 | 82 | 29.0 | 19 | 6.6 |
| 1984 | 2,877 | 2,909 | 65 | 22.2 | 84 | 28.8 | 19 | 6.6 |
| 1985 | 2,942 | 2,974 | 65 | 21.9 | 85 | 28.4 | 19 | 6.5 |
| 1990 | 3,269 | 3,302 | 66 | 19.9 | 87 | 26.4 | 21 | 6.4 |
| 1995 | 3,595 | 3,627 | 63 | 17.4 | 86 | 23.7 | 23 | 6.3 |
| 2000 | 3,898 | 3,925 | 56 | 14.2 | 80 | 20.4 | 24 | 6.2 |
| Medium series: | | | | | | | | |
| 1983 | 2,813 | 2,843 | 60 | 21.1 | 78 | 27.6 | 18 | 6.5 |
| 1984 | 2,873 | 2,904 | 61 | 20.8 | 79 | 27.3 | 19 | 6.5 |
| 1985 | 2,934 | 2,964 | 61 | 20.5 | 80 | 27.0 | 19 | 6.5 |
| 1990 | 3,237 | 3,267 | 60 | 18.4 | 81 | 24.7 | 21 | 6.4 |
| 1995 | 3,531 | 3,559 | 56 | 15.7 | 78 | 21.9 | 22 | 6.2 |
| 2000 | 3,793 | 3,816 | 47 | 12.3 | 71 | 18.5 | 24 | 6.2 |
| Low Series: | | | | | | | | |
| 1983 | 2,813 | 2,841 | 56 | 19.8 | 74 | 26.2 | 18 | 6.5 |
| 1984 | 2,869 | 2,898 | 56 | 19.5 | 75 | 25.9 | 19 | 6.4 |
| 1985 | 2,926 | 2,954 | 56 | 19.1 | 75 | 25.5 | 19 | 6.4 |
| 1990 | 3,205 | 3,232 | 54 | 16.8 | 75 | 23.1 | 20 | 6.3 |
| 1995 | 3,466 | 3,490 | 48 | 13.8 | 70 | 20.1 | 22 | 6.2 |
| 2000 | 3,688 | 3,707 | 38 | 10.3 | 61 | 16.5 | 23 | 6.2 |
| Constant series: | | | | | | | | |
| 1983 | 2,813 | 2,844 | 62 | 21.6 | 80 | 28.2 | 19 | 6.5 |
| 1984 | 2,875 | 2,907 | 64 | 21.9 | 83 | 28.5 | 19 | 6.5 |
| 1985 | 2,938 | 2,971 | 66 | 22.1 | 85 | 28.7 | 19 | 6.5 |
| 1990 | 3,285 | 3,323 | 75 | 22.5 | 97 | 29.1 | 22 | 6.5 |
| 1995 | 3,676 | 3,717 | 82 | 22.1 | 106 | 28.5 | 24 | 6.4 |
| 2000 | 4,094 | 4,136 | 85 | 20.6 | 112 | 27.0 | 26 | 6.3 |

# TABLE I-C.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—BULGARIA: 1950–2000

[Absolute numbers in thousands; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate | Number | Rate | Number | Rate |
| ESTIMATES | | | | | | | | |
| 1950 | 7,228 | 7,250 | 108 | 15.0 | 183 | 25.2 | 74 | 10.2 |
| 1955 | 7,461 | 7,499 | 83 | 11.1 | 151 | 20.1 | 68 | 9.0 |
| 1960 | 7,829 | 7,867 | 76 | 9.7 | 140 | 17.8 | 64 | 8.1 |
| 1965 | 8,178 | 8,201 | 59 | 7.2 | 126 | 15.3 | 67 | 8.1 |
| 1970 | 8,464 | 8,490 | 62 | 7.2 | 139 | 16.3 | 77 | 9.1 |
| 1975 | 8,710 | 8,721 | 55 | 6.3 | 145 | 16.6 | 90 | 10.3 |
| 1976 | 8,731 | 8,759 | 57 | 6.4 | 145 | 16.5 | 88 | 10.1 |
| 1977 | 8,786 | 8,804 | 47 | 5.4 | 142 | 16.1 | 94 | 10.7 |
| 1978 | 8,823 | 8,814 | 44 | 5.0 | 136 | 15.5 | 92 | 10.5 |
| 1979 | 8,805 | 8,826 | 41 | 4.6 | 135 | 15.3 | 94 | 10.7 |
| 1980 | 8,846 | 8,862 | 30 | 3.4 | 128 | 14.5 | 98 | 11.1 |
| 1981 | 8,877 | 8,891 | 29 | 3.3 | 124 | 14.0 | 95 | 10.7 |
| 1982 | 8,906 | 8,918 | 24 | 2.7 | 124 | 13.9 | 100 | 11.2 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 8,929 | 8,942 | 27 | 3.0 | 124 | 13.8 | 96 | 10.8 |
| 1984 | 8,856 | 8,969 | 27 | 3.0 | 124 | 13.8 | 97 | 10.9 |
| 1985 | 8,983 | 8,996 | 26 | 2.9 | 125 | 13.9 | 99 | 11.0 |
| 1990 | 9,115 | 9,130 | 29 | 3.1 | 131 | 14.3 | 102 | 11.2 |
| 1995 | 9,283 | 9,301 | 37 | 4.0 | 142 | 15.2 | 105 | 11.3 |
| 2000 | 9,464 | 9,481 | 34 | 3.5 | 147 | 15.5 | 113 | 11.9 |
| Medium series: | | | | | | | | |
| 1983 | 8,929 | 8,939 | 21 | 2.4 | 118 | 13.2 | 96 | 10.8 |
| 1984 | 8,950 | 8,960 | 20 | 2.3 | 117 | 13.1 | 97 | 10.9 |
| 1985 | 8,970 | 8,980 | 19 | 2.1 | 117 | 13.1 | 98 | 11.0 |
| 1990 | 9,060 | 9,068 | 18 | 1.9 | 120 | 13.2 | 102 | 11.2 |
| 1995 | 9,163 | 9,174 | 21 | 2.3 | 126 | 13.7 | 105 | 11.4 |
| 2000 | 9,258 | 9,265 | 14 | 1.5 | 127 | 13.7 | 113 | 12.2 |
| Low series: | | | | | | | | |
| 1983 | 8,929 | 8,936 | 16 | 1.7 | 112 | 12.5 | 96 | 10.8 |
| 1984 | 8,944 | 8,951 | 14 | 1.5 | 111 | 12.4 | 97 | 10.9 |
| 1985 | 8,958 | 8,964 | 12 | 1.3 | 110 | 12.3 | 98 | 11.0 |
| 1990 | 9,005 | 9,009 | 7 | .8 | 109 | 12.1 | 102 | 11.3 |
| 1995 | 9,048 | 9,051 | 7 | .7 | 111 | 12.3 | 104 | 11.5 |
| 2000 | 9,062 | 9,060 | −4 | −.5 | 108 | 11.9 | 113 | 12.4 |
| Constant series: | | | | | | | | |
| 1983 | 8,929 | 8,939 | 21 | 2.4 | 118 | 13.2 | 96 | 10.8 |
| 1984 | 8,950 | 8,960 | 20 | 2.2 | 117 | 13.1 | 97 | 10.9 |
| 1985 | 8,970 | 8,979 | 18 | 2.0 | 117 | 13.0 | 99 | 11.0 |
| 1990 | 9,053 | 9,061 | 16 | 1.7 | 117 | 13.0 | 102 | 11.2 |
| 1995 | 9,144 | 9,152 | 18 | 1.9 | 122 | 13.4 | 104 | 11.4 |
| 2000 | 9,217 | 9,221 | 9 | 9 | 121 | 13.2 | 113 | 12.2 |

## TABLE I-D.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—CZECHOSLOVAKIA: 1950–2000

[Absolute numbers in thousands, rates per thousand population, differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems, natural increase may not equal the difference between births and deaths due to rounding, see text for an explanation of the series]

| Year | Population [1] | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan 1 | July 1 | Number | Rate [2] | Number | Rate [2] | Number | Rate [2] |
| ESTIMATES | | | | | | | | |
| 1950 | 12,340 | 12,389 | 145 | 11.8 | 288 | 23.3 | 143 | 11.5 |
| 1955 | 13,024 | 13,093 | 139 | 10.7 | 265 | 20.3 | 126 | 9.6 |
| 1960 | 13,608 | 13,654 | 92 | 6.7 | 217 | 15.9 | 125 | 9.2 |
| 1965 | 14,097 | 14,147 | 91 | 6.4 | 232 | 16.4 | 141 | 10.0 |
| 1970 | 14,309 | 14,319 | 63 | 4.4 | 229 | 16.0 | 166 | 11.6 |
| 1975 | 14,715 | 14,772 | 120 | 8.1 | 289 | 19.6 | 170 | 11.5 |
| 1976 | 14,828 | 14,884 | 117 | 7.8 | 287 | 19.3 | 171 | 11.5 |
| 1977 | 14,939 | 14,990 | 108 | 7.2 | 281 | 18.8 | 173 | 11.6 |
| 1978 | 15,040 | 15,089 | 104 | 6.9 | 279 | 18.5 | 175 | 11.6 |
| 1979 | 15,137 | 15,182 | 97 | 6.4 | 272 | 17.9 | 176 | 11.6 |
| 1980 | 15,227 | 15,255 | 63 | 4.1 | 249 | 16.3 | 186 | 12.2 |
| 1981 | 15,289 | 15,320 | 58 | 3.8 | 238 | 15.5 | 180 | 11.8 |
| 1982 | 15,344 | 15,369 | 53 | 3.5 | 234 | 15.2 | 181 | 11.8 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 15,396 | 15,427 | 62 | 4.0 | 243 | 15.8 | 181 | 11.7 |
| 1984 | 15,458 | 15,489 | 61 | 3.9 | 242 | 15.6 | 181 | 11.7 |
| 1985 | 15,519 | 15,550 | 60 | 3.9 | 242 | 15.5 | 181 | 11.7 |
| 1990 | 15,813 | 15,844 | 62 | 3.9 | 240 | 15.2 | 179 | 11.3 |
| 1995 | 16,186 | 16,232 | 93 | 5.7 | 268 | 16.5 | 175 | 10.8 |
| 2000 | 16,681 | 16,733 | 103 | 6.2 | 287 | 17.1 | 184 | 11.0 |
| Medium series: | | | | | | | | |
| 1983 | 15,396 | 15,421 | 51 | 3.3 | 231 | 15.0 | 181 | 11.7 |
| 1984 | 15,447 | 15,471 | 48 | 3.1 | 230 | 14.8 | 181 | 11.7 |
| 1985 | 15,495 | 15,519 | 46 | 3.0 | 228 | 14.7 | 181 | 11.7 |
| 1990 | 15,708 | 15,729 | 42 | 2.7 | 220 | 14.0 | 178 | 11.3 |
| 1995 | 15,964 | 15,996 | 64 | 4.0 | 239 | 14.9 | 175 | 10.9 |
| 2000 | 16,296 | 16,328 | 65 | 4.0 | 248 | 15.2 | 183 | 11.2 |
| Low series: | | | | | | | | |
| 1983 | 15,396 | 15,416 | 40 | 2.6 | 220 | 14.3 | 180 | 11.7 |
| 1984 | 15,435 | 15,453 | 36 | 2.3 | 217 | 14.0 | 181 | 11.7 |
| 1985 | 15,471 | 15,488 | 33 | 2.1 | 214 | 13.8 | 181 | 11.7 |
| 1990 | 15,606 | 15,617 | 23 | 1.5 | 201 | 12.9 | 178 | 11.4 |
| 1995 | 15,752 | 15,770 | 37 | 2.3 | 211 | 13.4 | 175 | 11.1 |
| 2000 | 15,929 | 15,944 | 29 | 1.8 | 212 | 13.3 | 183 | 11.5 |
| Constant series: | | | | | | | | |
| 1983 | 15,396 | 15,421 | 51 | 3.3 | 231 | 15.0 | 181 | 11.7 |
| 1984 | 15,447 | 15,471 | 49 | 3.2 | 230 | 14.9 | 181 | 11.7 |
| 1985 | 15,496 | 15,520 | 47 | 3.1 | 229 | 14.7 | 181 | 11.7 |
| 1990 | 15,720 | 15,743 | 46 | 2.9 | 224 | 14.2 | 178 | 11.3 |
| 1995 | 16,004 | 16,040 | 72 | 4.5 | 247 | 15.4 | 175 | 10.9 |
| 2000 | 16,383 | 16,421 | 77 | 4.7 | 260 | 15.8 | 184 | 11.2 |

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[1] The official population totals for the years 1961–80 have been revised downward here to account for the differences of approximately 148,000 and 51,000 between the 1970 and 1980 census totals and the unrevised population estimates for those years. The revised estimates are based on the Mar. 1, 1961 census total of 13,745,577; reported births and deaths; adjustments to the implied annual net migration figures; and other intercensal adjustments necessary to be consistent with the Dec. 1, 1970 census total of 14,344,987 and the Dec. 1, 1980 census total of 15,283,095. These adjustments include the assumption that 60,000 refugees left during the last half of 1968 and 20,000 during the first half of 1969.

[2] Rates for the years 1961–80 are based on the published numbers of births and deaths and the revised midyear population totals. See footnote 1 above.

## TABLE I-E.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—GERMAN DEMOCRATIC REPUBLIC: 1950-2000

[Absolute numbers in thousands, rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population[1] | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate[2] | Number | Rate[2] | Number | Rate[2] |
| ESTIMATES | | | | | | | | |
| 1950 | [3] 18,388 | [3] 18,388 | 84 | 4.6 | 304 | 16.5 | 220 | 11.9 |
| 1955 | 17,929 | 17.832 | 79 | 4.4 | 293 | 16.4 | 214 | 12.0 |
| 1960 | 17,114 | 17,058 | 59 | 3.5 | 293 | 17.2 | 234 | 13.7 |
| 1965 | 17,004 | 17,020 | 51 | 3.0 | 281 | 16.5 | 230 | 13.5 |
| 1970 | 17,075 | 17,070 | −4 | −.2 | 237 | 13.9 | 241 | 14.1 |
| 1975 | 16.891 | 16,850 | −59 | −3.5 | 182 | 10.8 | 240 | 14.3 |
| 1976 | 16,820 | 16.786 | −38 | −2.3 | 195 | 11.6 | 234 | 13.9 |
| 1977 | 16,767 | 16,765 | −3 | −.2 | 223 | 13.3 | 226 | 13.5 |
| 1978 | 16,758 | 16,756 | −0 | −.0 | 232 | 13.9 | 232 | 13.9 |
| 1979 | 16,751 | 16,745 | 2 | .1 | 235 | 14.0 | 233 | 13.9 |
| 1980 | 16,740 | 16,737 | 7 | .4 | 245 | 14.6 | 238 | 14.2 |
| 1981 | 16,740 | 16,736 | 5 | .3 | 238 | 14.2 | 232 | 13.9 |
| 1982 | 16,732 | 16,697 | 12 | .7 | 240 | 14.4 | 228 | 13.7 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 16,702 | 16,716 | 28 | 1.7 | 254 | 15.2 | 226 | 13.5 |
| 1984 | 16,730 | 16,747 | 33 | 2.0 | 258 | 15.4 | 225 | 13.4 |
| 1985 | 16,764 | 16,783 | 38 | 2.3 | 261 | 15.5 | 223 | 13.3 |
| 1990 | 16,980 | 17,004 | 47 | 2.8 | 255 | 15.0 | 207 | 12.2 |
| 1995 | 17,205 | 17,222 | 35 | 2.0 | 231 | 13.4 | 196 | 11.4 |
| 2000 | 17,381 | 17,403 | 44 | 2.5 | 243 | 14.0 | 200 | 11.5 |
| Medium series: | | | | | | | | |
| 1983 | 16,702 | 16,710 | 16 | 1.0 | 242 | 14.5 | 226 | 13.5 |
| 1984 | 16,718 | 16,728 | 20 | 1.2 | 244 | 14.6 | 225 | 13.4 |
| 1985 | 16,738 | 16,749 | 23 | 1.4 | 245 | 14.6 | 222 | 13.3 |
| 1990 | 16,864 | 16,876 | 26 | 1.5 | 233 | 13.8 | 207 | 12.3 |
| 1995 | 16,972 | 16,977 | 9 | .5 | 205 | 12.1 | 196 | 11.5 |
| 2000 | 17,009 | 17,015 | 11 | .7 | 211 | 12.4 | 199 | 11.7 |
| Low series: | | | | | | | | |
| 1983 | 16,702 | 16,704 | 4 | .2 | 230 | 13.8 | 226 | 13.5 |
| 1984 | 16,706 | 16,709 | 6 | .4 | 231 | 13.8 | 224 | 13.4 |
| 1985 | 16,713 | 16,716 | 8 | .5 | 230 | 13.8 | 222 | 13.3 |
| 1990 | 16,750 | 16,753 | 5 | .3 | 212 | 12.6 | 207 | 12.3 |
| 1995 | 16,748 | 16,741 | −15 | −.9 | 181 | 10.8 | 195 | 11.7 |
| 2000 | 16,655 | 16.646 | −19 | −1.1 | 180 | 10.8 | 199 | 12.0 |
| Constant series: | | | | | | | | |
| 1983 | 16,702 | 16,710 | 16 | 1.0 | 242 | 14.5 | 226 | 13.5 |
| 1984 | 16,718 | 16,728 | 19 | 1.1 | 243 | 14.5 | 225 | 13.4 |
| 1985 | 16,737 | 16,747 | 21 | 1.2 | 243 | 14.5 | 222 | 13.3 |
| 1990 | 16,840 | 16,849 | 18 | 1.1 | 225 | 13.4 | 207 | 12.3 |
| 1995 | 16,904 | 16,903 | −2 | −.1 | 194 | 11.5 | 195 | 11.6 |
| 2000 | 16,878 | 16,875 | −4 | −.3 | 195 | 11.5 | 199 | 11.8 |

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[1] The official population totals for the years 1951-64 have been revised downward here to account for the difference of approximately 212,000 between the Dec. 31, 1964 Census total of 17,003,632 and the unrevised population estimate for that date. The revised estimates are based on the Aug. 31, 1950 census total of 18,388,172; reported births and deaths; and adjustments to the implied annual net emigration figures so as to be consistent with the 1964 census total. The official midyear population figure for 1970 was adjusted downward slightly to be consistent with the Jan. 1, 1971 census total of 17,068,318. The adjusted estimate was based on the 1971 census figure and the estimated net population change for the last half of 1970.

[2] Rates for the years 1951-64 and 1970 are based on the published numbers of births and deaths and the revised midyear population totals. See footnote 1 above.

[3] Census of Aug. 31, 1950.

# TABLE I-F.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—HUNGARY: 1950–2000

[Absolute numbers in thousands; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degree, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate | Number | Rate | Number | Rate |
| ESTIMATES | | | | | | | | |
| 1950 | 9,293 | 9,338 | 89 | 9.5 | 196 | 20.9 | 107 | 11.4 |
| 1955 | 9,767 | 9,825 | 113 | 11.4 | 210 | 21.4 | 98 | 10.0 |
| 1960 | 9,961 | 9,984 | 45 | 4.5 | 146 | 14.7 | 102 | 10.2 |
| 1965 | 10,140 | 10,153 | 25 | 2.4 | 133 | 13.1 | 108 | 10.7 |
| 1970 | 10,322 | 10,337 | 32 | 3.1 | 152 | 14.7 | 120 | 11.6 |
| 1975 | 10,501 | 10,532 | 63 | 6.0 | 194 | 18.4 | 131 | 12.4 |
| 1976 | 10,563 | 10,589 | 53 | 5.0 | 185 | 17.5 | 132 | 12.5 |
| 1977 | 10,615 | 10,637 | 46 | 4.3 | 176 | 16.7 | 132 | 12.4 |
| 1978 | 10,660 | 10,673 | 28 | 2.7 | 168 | 15.8 | 140 | 13.1 |
| 1979 | 10,687 | 10,698 | 24 | 2.2 | 160 | 15.0 | 137 | 12.8 |
| 1980 | 10,709 | 10,711 | 3 | .3 | 149 | 13.9 | 145 | 13.6 |
| 1981 | 10,713 | 10,712 | −2 | −0.2 | 143 | 13.3 | 145 | 13.5 |
| 1982 | 10,711 | 10,706 | −11 | −1.0 | 134 | 12.5 | 144 | 13.5 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 10,700 | 10,696 | −8 | −.7 | 137 | 12.8 | 145 | 13.5 |
| 1984 | 10,693 | 10,688 | −9 | −.8 | 136 | 12.7 | 145 | 13.6 |
| 1985 | 10,684 | 10,679 | −9 | −.9 | 136 | 12.7 | 145 | 13.6 |
| 1990 | 10,646 | 10,646 | −1 | −.1 | 142 | 13.3 | 142 | 13.4 |
| 1995 | 10,692 | 10,703 | 22 | 2.0 | 162 | 15.1 | 140 | 13.1 |
| 2000 | 10,825 | 10,841 | 30 | 2.8 | 175 | 16.1 | 144 | 13.3 |
| Medium series: | | | | | | | | |
| 1983 | 10,700 | 10,693 | −14 | −1.3 | 131 | 12.2 | 145 | 13.5 |
| 1984 | 10,686 | 10,678 | −16 | −1.5 | 129 | 12.1 | 145 | 13.6 |
| 1985 | 10,670 | 10,661 | −17 | −1.6 | 127 | 12.0 | 145 | 13.6 |
| 1990 | 10,585 | 10,578 | −13 | −1.2 | 129 | 12.2 | 142 | 13.4 |
| 1995 | 10,559 | 10,561 | 4 | .4 | 144 | 13.6 | 140 | 13.3 |
| 2000 | 10,592 | 10,595 | 7 | .7 | 151 | 14.3 | 144 | 13.6 |
| Low series: | | | | | | | | |
| 1983 | 10,700 | 10,690 | −20 | −1.9 | 124 | 11.6 | 144 | 13.5 |
| 1984 | 10,680 | 10,668 | −23 | −2.2 | 121 | 11.4 | 145 | 13.6 |
| 1985 | 10,657 | 10,644 | −25 | −2.4 | 120 | 11.2 | 145 | 13.6 |
| 1990 | 10,525 | 10,513 | −24 | −2.3 | 118 | 11.2 | 142 | 13.5 |
| 1995 | 10,432 | 10,426 | −13 | −1.2 | 127 | 12.2 | 140 | 13.4 |
| 2000 | 10,370 | 10,363 | −14 | −1.4 | 129 | 12.5 | 144 | 13.9 |
| Constant series: | | | | | | | | |
| 1983 | 10,700 | 10,693 | −14 | −1.3 | 131 | 12.2 | 145 | 13.5 |
| 1984 | 10,686 | 10,678 | −17 | −1.6 | 128 | 12.0 | 145 | 13.6 |
| 1985 | 10,669 | 10,660 | −19 | −1.8 | 126 | 11.8 | 145 | 13.6 |
| 1990 | 10,568 | 10,559 | −18 | −1.7 | 124 | 11.7 | 142 | 13.5 |
| 1995 | 10,507 | 10,504 | −6 | −.6 | 134 | 12.7 | 140 | 13.3 |
| 2000 | 10,479 | 10,476 | −7 | −.7 | 136 | 13.0 | 144 | 13.7 |

## TABLE I-G.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—POLAND: 1950-2000

[Absolute numbers in thousands, rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding, see text for an explanation of the series]

| Year | Population [1] | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate [2] | Number | Rate [2] | Number | Rate [2] |
| ESTIMATES | | | | | | | | |
| 1950 | 24,613 | 24,824 | 474 | 19.1 | 763 | 30.7 | 289 | 11.6 |
| 1955 | 26,959 | 27,221 | 532 | 19.6 | 794 | 29.2 | 262 | 9.6 |
| 1960 | 29,384 | 29,590 | 445 | 15.0 | 669 | 22.6 | 224 | 7.6 |
| 1965 | 31,123 | 31,262 | 314 | 10.0 | 546 | 17.5 | 232 | 7.4 |
| 1970 | 32,400 | 32,526 | 279 | 8.6 | 546 | 16.8 | 267 | 8.2 |
| 1975 | 33,805 | 33,969 | 347 | 10.2 | 644 | 19.0 | 297 | 8.7 |
| 1976 | 34,134 | 34,299 | 366 | 10.7 | 670 | 19.6 | 304 | 8.9 |
| 1977 | 34,465 | 34,621 | 350 | 10.1 | 663 | 19.2 | 313 | 9.0 |
| 1978 | 34,777 | 34,929 | 341 | 9.8 | 666 | 19.1 | 325 | 9.3 |
| 1979 | 35,081 | 35,257 | 365 | 10.4 | 688 | 19.5 | 323 | 9.2 |
| 1980 | 35,413 | 35,578 | 343 | 9.6 | 693 | 19.5 | 350 | 9.8 |
| 1981 | 35,735 | 35,902 | 350 | 9.7 | 679 | 18.9 | 329 | 9.2 |
| 1982 | 36,062 | 36,227 | 367 | 10.1 | 702 | 19.4 | 335 | 9.2 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 36,399 | 36,593 | 390 | 10.6 | 729 | 19.9 | 339 | 9.3 |
| 1984 | 36,788 | 36,975 | 374 | 10.1 | 717 | 19.4 | 343 | 9.3 |
| 1985 | 37,162 | 37,340 | 357 | 9.6 | 704 | 18.9 | 347 | 9.3 |
| 1990 | 38,782 | 38,924 | 284 | 7.3 | 642 | 16.5 | 358 | 9.2 |
| 1995 | 40,156 | 40,289 | 267 | 6.6 | 636 | 15.8 | 369 | 9.2 |
| 2000 | 41,492 | 41,627 | 270 | 6.5 | 672 | 16.1 | 402 | 9.7 |
| Medium series: | | | | | | | | |
| 1983 | 36,399 | 36,576 | 355 | 9.7 | 694 | 19.0 | 339 | 9.3 |
| 1984 | 36,754 | 36,922 | 337 | 9.1 | 680 | 18.4 | 343 | 9.3 |
| 1985 | 37,091 | 37,249 | 317 | 8.5 | 664 | 17.8 | 347 | 9.3 |
| 1990 | 38,488 | 38,604 | 232 | 6.0 | 589 | 15.3 | 357 | 9.2 |
| 1995 | 39,575 | 39,674 | 199 | 5.0 | 568 | 14.3 | 368 | 9.3 |
| 2000 | 40,533 | 40,624 | 181 | 4.5 | 582 | 14.3 | 401 | 9.9 |
| Low series: | | | | | | | | |
| 1983 | 36,399 | 36,559 | 321 | 8.8 | 660 | 18.0 | 338 | 9.3 |
| 1984 | 36,720 | 36,870 | 300 | 8.1 | 642 | 17.4 | 342 | 9.3 |
| 1985 | 37,020 | 37,159 | 278 | 7.5 | 624 | 16.8 | 346 | 9.3 |
| 1990 | 38,201 | 38,293 | 183 | 4.8 | 539 | 14.1 | 356 | 9.3 |
| 1995 | 39,015 | 39,083 | 136 | 3.5 | 503 | 12.9 | 367 | 9.4 |
| 2000 | 39,620 | 39,669 | 98 | 2.5 | 498 | 12.5 | 399 | 10.1 |
| Constant series: | | | | | | | | |
| 1983 | 36,399 | 36,576 | 355 | 9.7 | 694 | 19.0 | 339 | 9.3 |
| 1984 | 36,754 | 36,925 | 342 | 9.3 | 685 | 18.6 | 343 | 9.3 |
| 1985 | 37,096 | 37,260 | 328 | 8.8 | 674 | 18.1 | 347 | 9.3 |
| 1990 | 39,595 | 38,728 | 267 | 6.9 | 624 | 16.1 | 357 | 9.2 |
| 1995 | 39,900 | 40,029 | 258 | 6.5 | 628 | 15.7 | 369 | 9.2 |
| 2000 | 41,213 | 41,349 | 271 | 6.6 | 673 | 16.3 | 402 | 9.7 |

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[1] The official population totals for the years 1951-78 have been revised downward here to account for the differences of approximately 123,000, 95,000, and 112,000 between the 1960, 1970, and 1978 census totals and the unrevised population estimates for those years. The revised estimates are based on the Dec. 3, 1950 census total of 25,008,179; reported births, deaths, and net migration; and intercensal adjustments necessary to be consistent with the Dec. 6, 1960 census total of 29,775,508; the Dec. 8, 1970 census total of 32,642,270; and the Dec. 7, 1978 census total of 35,061,450.

[2] Rates for the years 1951-78 are based on published numbers of births and deaths and the revised population totals. See footnote 1 above.

## TABLE I-H.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—ROMANIA: 1950-2000

[Absolute numbers in thousands; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate | Number | Rate | Number | Rate |
| ESTIMATES | | | | | | | | |
| 1950 | 16,204 | 16,311 | 225 | 13.8 | 427 | 26.2 | 202 | 12.4 |
| 1955 | 17,181 | 17,325 | 275 | 15.9 | 443 | 25.6 | 168 | 9.7 |
| 1960 | 18,319 | 18,403 | 192 | 10.4 | 352 | 19.1 | 161 | 8.7 |
| 1965 | 18,980 | 19,027 | 115 | 6.0 | 278 | 14.6 | 163 | 8.6 |
| 1970 | 20,140 | 20,253 | 234 | 11.6 | 427 | 21.1 | 193 | 9.5 |
| 1975 | 21,141 | 21,245 | 221 | 10.4 | 418 | 19.7 | 198 | 9.3 |
| 1976 | 21,353 | 21,446 | 212 | 9.9 | 417 | 19.5 | 205 | 9.6 |
| 1977 | 21,559 | 21,658 | 215 | 10.0 | 424 | 19.6 | 209 | 9.6 |
| 1978 | 21,758 | 21,855 | 205 | 9.4 | 417 | 19.1 | 212 | 9.7 |
| 1979 | 21,953 | 22,048 | 193 | 8.7 | 411 | 18.6 | 217 | 9.9 |
| 1980 | 22,133 | 22,201 | 167 | 7.6 | 399 | 18.0 | 232 | 10.4 |
| 1981 | 22,285 | 22,353 | 156 | 7.0 | 381 | 17.0 | 225 | 10.0 |
| 1982 | 22,424 | 22,478 | 120 | 5.3 | 344 | 15.3 | 224 | 10.0 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 22,527 | 22,593 | 131 | 5.8 | 358 | 15.8 | 227 | 10.0 |
| 1984 | 22,659 | 22,722 | 128 | 5.6 | 357 | 15.7 | 229 | 10.1 |
| 1985 | 22,786 | 22,849 | 126 | 5.5 | 358 | 15.7 | 232 | 10.1 |
| 1990 | 23,451 | 23,528 | 155 | 6.6 | 397 | 16.9 | 242 | 10.3 |
| 1995 | 24,293 | 24,380 | 174 | 7.1 | 421 | 17.3 | 248 | 10.2 |
| 2000 | 25,138 | 25,218 | 159 | 6.3 | 429 | 17.0 | 270 | 10.7 |
| Medium series: | | | | | | | | |
| 1983 | 22,527 | 22,585 | 115 | 5.1 | 341 | 15.1 | 226 | 10.0 |
| 1984 | 22,642 | 22,697 | 109 | 4.8 | 338 | 14.9 | 229 | 10.1 |
| 1985 | 22,751 | 22,804 | 106 | 4.6 | 337 | 14.8 | 231 | 10.1 |
| 1990 | 23,292 | 23,354 | 123 | 5.3 | 364 | 15.6 | 241 | 10.3 |
| 1995 | 23,948 | 24,012 | 129 | 5.4 | 376 | 15.6 | 247 | 10.3 |
| 2000 | 24,546 | 24,597 | 102 | 4.2 | 371 | 15.1 | 268 | 10.9 |
| Low series: | | | | | | | | |
| 1983 | 22,527 | 22,576 | 98 | 4.3 | 324 | 14.3 | 226 | 10.0 |
| 1984 | 22,625 | 22,671 | 91 | 4.0 | 319 | 14.1 | 228 | 10.1 |
| 1985 | 22,716 | 22,759 | 86 | 3.8 | 317 | 13.9 | 231 | 10.1 |
| 1990 | 23,138 | 23,184 | 92 | 4.0 | 332 | 14.3 | 240 | 10.3 |
| 1995 | 23,616 | 23,660 | 87 | 3.7 | 332 | 14.1 | 245 | 10.4 |
| 2000 | 23,983 | 24,007 | 50 | 2.1 | 317 | 13.2 | 267 | 11.1 |
| Constant series: | | | | | | | | |
| 1983 | 22,527 | 22,585 | 115 | 5.1 | 341 | 15.1 | 226 | 10.0 |
| 1984 | 22,642 | 22,697 | 111 | 4.9 | 339 | 15.0 | 229 | 10.1 |
| 1985 | 22,753 | 22,807 | 108 | 4.8 | 340 | 14.9 | 231 | 10.1 |
| 1990 | 23,323 | 23,390 | 134 | 5.7 | 375 | 16.0 | 241 | 10.3 |
| 1995 | 24,051 | 24,126 | 149 | 6.2 | 396 | 16.4 | 247 | 10.2 |
| 2000 | 24,766 | 24,831 | 131 | 5.3 | 400 | 16.1 | 269 | 10.8 |

# TABLE I-I.—ESTIMATED AND PROJECTED TOTAL POPULATION, COMPONENTS OF POPULATION CHANGE, AND VITAL RATES—YUGOSLAVIA: 1950–2000

[Absolute numbers in thousands; rates per thousand population; differences between natural increase and year-to-year changes in the population estimates are due, in varying degrees, to migration and discrepancies in the reporting systems; natural increase may not equal the difference between births and deaths due to rounding; see text for an explanation of the series]

| Year | Population [1] | | Natural increase | | Births | | Deaths | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 1 | July 1 | Number | Rate [2] | Number | Rate [2] | Number | Rate [2] |
| ESTIMATES | | | | | | | | |
| 1950 | 16,240 | 16,346 | 282 | 17.3 | 494 | 30.2 | 212 | 13.0 |
| 1955 | 17,402 | 17,519 | 271 | 15.5 | 471 | 26.9 | 200 | 11.4 |
| 1960 | 18,308 | 18,402 | 250 | 13.6 | 433 | 23.5 | 183 | 9.9 |
| 1965 | 19,328 | 19,434 | 238 | 12.2 | 408 | 21.0 | 171 | 8.8 |
| 1970 | 20,290 | 20,371 | 181 | 8.9 | 363 | 17.8 | 181 | 8.9 |
| 1975 | 21,249 | 21,347 | 203 | 9.5 | 388 | 18.2 | 185 | 8.7 |
| 1976 | 21,449 | 21,551 | 209 | 9.7 | 392 | 18.2 | 183 | 8.5 |
| 1977 | 21,652 | 21,754 | 202 | 9.3 | 385 | 17.7 | 183 | 8.4 |
| 1978 | 21,848 | 21,943 | 190 | 8.7 | 381 | 17.4 | 191 | 8.7 |
| 1979 | 22,037 | 22,132 | 188 | 8.5 | 379 | 17.1 | 190 | 8.6 |
| 1980 | 22,218 | 22,304 | 185 | 8.3 | 382 | 17.1 | 197 | 8.8 |
| 1981 | 22,387 | 22,471 | 168 | 7.5 | 369 | 16.4 | 201 | 9.0 |
| 1982 | 22,558 | 22,646 | 173 | 7.6 | 375 | 16.5 | 202 | 8.9 |
| PROJECTIONS | | | | | | | | |
| High series: | | | | | | | | |
| 1983 | 22,732 | 22,827 | 190 | 8.3 | 395 | 17.3 | 205 | 9.0 |
| 1984 | 22,922 | 23,017 | 189 | 8.2 | 397 | 17.2 | 208 | 9.0 |
| 1985 | 23,112 | 23,206 | 188 | 8.1 | 399 | 17.2 | 210 | 9.1 |
| 1990 | 24,042 | 24,134 | 184 | 7.6 | 402 | 16.6 | 217 | 9.0 |
| 1995 | 24,964 | 25,053 | 178 | 7.1 | 407 | 16.2 | 228 | 9.1 |
| 2000 | 25,819 | 25,899 | 160 | 6.2 | 415 | 16.0 | 255 | 9.8 |
| Medium series: | | | | | | | | |
| 1983 | 22,732 | 22,818 | 172 | 7.5 | 376 | 16.5 | 204 | 9.0 |
| 1984 | 22,904 | 22,988 | 169 | 7.3 | 376 | 16.4 | 207 | 9.0 |
| 1985 | 23,073 | 23,155 | 166 | 7.2 | 375 | 16.2 | 210 | 9.1 |
| 1990 | 23,869 | 23,945 | 151 | 6.3 | 368 | 15.4 | 217 | 9.0 |
| 1995 | 24,605 | 24,673 | 135 | 5.5 | 362 | 14.7 | 227 | 9.2 |
| 2000 | 25,221 | 25,274 | 105 | 4.2 | 359 | 14.2 | 253 | 10.0 |
| Low series: | | | | | | | | |
| 1983 | 22,732 | 22,809 | 153 | 6.7 | 357 | 15.7 | 204 | 8.9 |
| 1984 | 22,885 | 22,960 | 148 | 6.5 | 355 | 15.5 | 207 | 9.0 |
| 1985 | 23,034 | 23,106 | 144 | 6.2 | 353 | 15.3 | 209 | 9.1 |
| 1990 | 23,700 | 23,760 | 120 | 5.0 | 336 | 14.1 | 216 | 9.1 |
| 1995 | 24,260 | 24,307 | 94 | 3.9 | 320 | 13.2 | 226 | 9.3 |
| 2000 | 24,652 | 24,680 | 55 | 2.2 | 307 | 12.4 | 252 | 10.2 |
| Constant series: | | | | | | | | |
| 1983 | 22,732 | 22,818 | 172 | 7.5 | 376 | 16.5 | 204 | 9.0 |
| 1984 | 22,904 | 22,989 | 170 | 7.4 | 377 | 16.4 | 207 | 9.0 |
| 1985 | 23,074 | 23,157 | 168 | 7.2 | 377 | 16.3 | 210 | 9.1 |
| 1990 | 23,889 | 23,968 | 158 | 6.6 | 375 | 15.6 | 217 | 9.0 |
| 1995 | 24,668 | 24,741 | 146 | 5.9 | 374 | 15.1 | 228 | 9.2 |
| 2000 | 25,351 | 25,412 | 122 | 4.8 | 375 | 14.8 | 254 | 10.0 |

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[1] The official population totals for the years 1971–79 have been revised downward here to account for the difference of approximately 40,000 between the 1981 census and the unrevised population estimate for that year. The revised estimates are based on the Mar. 31, 1971 census total of 20,522,972 and adjustments to the official annual population figures so as to be consistent with the Mar. 31, 1981 census total of 22,424,711.

[2] Rates for the years 1971–79 are based on the published numbers of births and deaths and the revised midyear population totals. See footnote 1 above.

## TABLE II-A.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—8 EASTERN EUROPEAN COUNTRIES COMBINED, 1980-2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 133,932 | 137,951 | 142,098 | 146,373 | 150,698 | 65,366 | 67,417 | 69,581 | 71,793 | 74,028 | 68,566 | 70,534 | 72,518 | 74,580 | 76,670 |
| Medium | | 137,722 | 141,102 | 144,317 | 147,248 | | 67,299 | 69,069 | 70,738 | 72,258 | | 70,423 | 72,032 | 73,579 | 74,990 |
| Low | | 137,494 | 140,130 | 142,338 | 143,960 | | 67,183 | 68,571 | 69,723 | 70,572 | | 70,312 | 71,559 | 72,615 | 73,389 |
| Constant | | 137,733 | 141,275 | 144,854 | 148,381 | | 67,305 | 69,158 | 71,014 | 72,840 | | 70,428 | 72,117 | 73,840 | 75,541 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 11,431 | 11,169 | 11,255 | 11,346 | 11,769 | 5,856 | 5,725 | 5,774 | 5,823 | 6,043 | 5,575 | 5,444 | 5,481 | 5,522 | 5,727 |
| Medium | | 10,940 | 10,486 | 10,282 | 10,371 | | 5,608 | 5,380 | 5,277 | 5,325 | | 5,333 | 5,106 | 5,005 | 5,046 |
| Low | | 10,713 | 9,741 | 9,271 | 9,058 | | 5,491 | 4,997 | 4,758 | 4,650 | | 5,222 | 4,743 | 4,513 | 4,407 |
| Constant | | 10,951 | 10,648 | 10,648 | 10,970 | | 5,613 | 5,463 | 5,465 | 5,632 | | 5,338 | 5,185 | 5,183 | 5,338 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 10,560 | 11,358 | 11,122 | 11,212 | 11,305 | 5,414 | 5,816 | 5,696 | 5,748 | 5,799 | 5,147 | 5,541 | 5,426 | 5,464 | 5,506 |
| Medium | | | 10,895 | 10,446 | 10,245 | | | 5,579 | 5,355 | 5,255 | | | 5,315 | 5,091 | 4,990 |
| Low | | | 10,669 | 9,703 | 9,238 | | | 5,464 | 4,975 | 4,739 | | | 5,205 | 4,729 | 4,500 |
| Constant | | | 10,906 | 10,607 | 10,608 | | | 5,585 | 5,438 | 5,442 | | | 5,321 | 5,169 | 5,167 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 10,216 | 10,541 | 11,341 | 11,107 | 11,198 | 5,234 | 5,400 | 5,805 | 5,686 | 5,739 | 4,982 | 5,141 | 5,535 | 5,421 | 5,459 |
| Medium | | | | 10,880 | 10,433 | | | | 5,570 | 5,347 | | | | 5,310 | 5,086 |
| Low | | | | 10,654 | 9,692 | | | | 5,454 | 4,967 | | | | 5,200 | 4,725 |
| Constant | | | | 10,891 | 10,593 | | | | 5,575 | 5,429 | | | | 5,316 | 5,164 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 10,214 | 10,191 | 10,520 | 11,319 | 11,088 | 5,239 | 5,216 | 5,384 | 5,789 | 5,672 | 4,975 | 4,976 | 5,135 | 5,530 | 5,416 |
| Medium | | | | | 10,861 | | | | | 5,556 | | | | | 5,306 |
| Low | | | | | 10,636 | | | | | 5,440 | | | | | 5,195 |
| Constant | | | | | 10,872 | | | | | 5,561 | | | | | 5,311 |
| 20 to 24 yr | 11,256 | 10,181 | 10,157 | 10,486 | 11,286 | 5,757 | 5,214 | 5,188 | 5,358 | 5,763 | 5,499 | 4,967 | 4,968 | 5,128 | 5,523 |
| 25 to 29 yr | 11,307 | 11,165 | 10,137 | 10,116 | 10,447 | 5,760 | 5,696 | 5,180 | 5,157 | 5,327 | 5,546 | 5,469 | 4,957 | 4,959 | 5,120 |
| 30 to 34 yr | 9,250 | 11,200 | 11,106 | 10,087 | 10,069 | 4,681 | 5,685 | 5,652 | 5,142 | 5,121 | 4,569 | 5,516 | 5,454 | 4,945 | 4,948 |
| 35 to 39 yr | 8,098 | 9,162 | 11,116 | 11,026 | 10,020 | 4,054 | 4,615 | 5,624 | 5,593 | 5,093 | 4,042 | 4,547 | 5,492 | 5,433 | 4,928 |
| 40 to 44 yr | 8,606 | 7,990 | 9,055 | 10,991 | 10,907 | 4,274 | 3,977 | 4,539 | 5,534 | 5,507 | 4,332 | 4,013 | 4,516 | 5,457 | 5,400 |
| 45 to 49 yr | 8,552 | 8,434 | 7,841 | 8,895 | 10,802 | 4,233 | 4,155 | 3,874 | 4,426 | 5,400 | 4,319 | 4,278 | 3,967 | 4,469 | 5,402 |
| 50 to 54 yr | 8,090 | 8,277 | 8,190 | 7,620 | 8,656 | 3,846 | 4,048 | 3,989 | 3,722 | 4,259 | 4,245 | 4,228 | 4,201 | 3,898 | 4,397 |
| 55 to 59 yr | 7,081 | 7,693 | 7,902 | 7,833 | 7,296 | 3,155 | 3,588 | 3,795 | 3,748 | 3,500 | 3,926 | 4,104 | 4,107 | 4,086 | 3,796 |
| 60 to 64 yr | 4,041 | 6,576 | 7,172 | 7,376 | 7,330 | 1,752 | 2,848 | 3,255 | 3,450 | 3,417 | 2,290 | 3,728 | 3,917 | 3,926 | 3,914 |
| 65 to 69 yr | 5,579 | 3,609 | 5,901 | 6,448 | 6,641 | 2,372 | 1,502 | 2,450 | 2,812 | 2,988 | 3,206 | 2,107 | 3,451 | 3,635 | 3,653 |
| 70 to 74 yr | 4,507 | 4,623 | 3,025 | 4,964 | 5,437 | 1,869 | 1,852 | 1,184 | 1,938 | 2,237 | 2,638 | 2,772 | 1,841 | 3,026 | 3,200 |
| 75 yr and over | 5,143 | 5,782 | 6,259 | 5,547 | 6,445 | 1,868 | 2,081 | 2,191 | 1,866 | 2,164 | 3,272 | 3,702 | 4,068 | 3,680 | 4,281 |

## TABLE II-B.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—ALBANIA, 1980–2000

[Numbers in thousands as of Jan 1; figures may not add to totals due to rounding, see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 2,644 | 2,942 | 3,269 | 3,595 | 3,898 | 1,355 | 1,506 | 1,672 | 1,836 | 1,988 | 1,289 | 1,436 | 1,598 | 1,759 | 1,910 |
| Medium | | 2,934 | 3,237 | 3,531 | 3,793 | | 1,502 | 1,655 | 1,803 | 1,934 | | 1,432 | 1,582 | 1,728 | 1,859 |
| Low | | 2,926 | 3,205 | 3,466 | 3,688 | | 1,498 | 1,639 | 1,770 | 1,880 | | 1,428 | 1,566 | 1,696 | 1,808 |
| Constant | | 2,938 | 3,285 | 3,676 | 4,094 | | 1,504 | 1,680 | 1,878 | 2,089 | | 1,434 | 1,605 | 1,799 | 2,005 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 332 | 366 | 405 | 412 | 398 | 170 | 188 | 208 | 212 | 204 | 162 | 178 | 197 | 201 | 193 |
| Medium | | 358 | 381 | 380 | 357 | | 184 | 195 | 195 | 183 | | 174 | 185 | 185 | 174 |
| Low | | 351 | 356 | 347 | 316 | | 180 | 183 | 178 | 163 | | 171 | 173 | 169 | 154 |
| Constant | | 363 | 424 | 477 | 515 | | 186 | 218 | 245 | 264 | | 177 | 206 | 232 | 250 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 326 | 327 | 360 | 399 | 406 | 167 | 167 | 185 | 205 | 208 | 159 | 159 | 176 | 194 | 198 |
| Medium | | | 353 | 375 | 374 | | | 181 | 192 | 192 | | | 172 | 183 | 182 |
| Low | | | 345 | 350 | 342 | | | 177 | 180 | 175 | | | 168 | 171 | 166 |
| Constant | | | 357 | 418 | 470 | | | 183 | 214 | 241 | | | 174 | 203 | 229 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 310 | 325 | 326 | 360 | 398 | 159 | 166 | 167 | 184 | 204 | 151 | 159 | 159 | 175 | 194 |
| Medium | | | | 352 | 374 | | | | 180 | 192 | | | | 172 | 182 |
| Low | | | | 344 | 350 | | | | 176 | 179 | | | | 168 | 170 |
| Constant | | | | 356 | 417 | | | | 183 | 214 | | | | 174 | 203 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 303 | 309 | 325 | 325 | 359 | 157 | 159 | 166 | 166 | 184 | 147 | 151 | 159 | 159 | 175 |
| Medium | | | | | 351 | | | | | 180 | | | | | 171 |
| Low | | | | | 343 | | | | | 176 | | | | | 168 |
| Constant | | | | | 356 | | | | | 182 | | | | | 174 |
| 20 to 24 yr | 263 | 302 | 308 | 324 | 324 | 136 | 156 | 158 | 165 | 166 | 127 | 146 | 150 | 159 | 159 |
| 25 to 29 yr | 198 | 262 | 301 | 307 | 323 | 102 | 135 | 155 | 157 | 165 | 95 | 127 | 146 | 150 | 158 |
| 30 to 34 yr | 161 | 197 | 261 | 300 | 306 | 84 | 102 | 134 | 154 | 156 | 77 | 95 | 126 | 145 | 149 |
| 35 to 39 yr | 145 | 160 | 195 | 259 | 298 | 77 | 83 | 101 | 133 | 153 | 68 | 77 | 95 | 125 | 145 |
| 40 to 44 yr | 133 | 143 | 158 | 194 | 257 | 71 | 76 | 82 | 100 | 132 | 62 | 68 | 76 | 94 | 125 |
| 45 to 49 yr | 109 | 131 | 141 | 156 | 191 | 58 | 70 | 75 | 81 | 98 | 51 | 62 | 67 | 75 | 93 |
| 50 to 54 yr | 93 | 106 | 128 | 138 | 153 | 48 | 56 | 67 | 72 | 79 | 44 | 50 | 61 | 66 | 74 |
| 55 to 59 yr | 70 | 89 | 102 | 123 | 133 | 34 | 46 | 53 | 64 | 69 | 36 | 43 | 49 | 59 | 64 |
| 60 to 64 yr | 61 | 65 | 84 | 96 | 116 | 30 | 31 | 42 | 49 | 59 | 31 | 34 | 41 | 46 | 57 |
| 65 to 69 yr | 51 | 56 | 60 | 76 | 87 | 24 | 27 | 28 | 38 | 44 | 27 | 29 | 32 | 38 | 43 |
| 70 to 74 yr | 38 | 44 | 48 | 52 | 67 | 17 | 20 | 23 | 23 | 32 | 21 | 24 | 26 | 28 | 34 |
| 75 yr and over | 51 | 58 | 67 | 75 | 83 | 20 | 24 | 28 | 32 | 35 | 30 | 34 | 39 | 43 | 49 |

# TABLE II-C.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—BULGARIA, 1980-2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 8,846 | 8,983 | 9,115 | 9,283 | 9,464 | 4,409 | 4,467 | 4,524 | 4,600 | 4,686 | 4,437 | 4,516 | 4,592 | 4,683 | 4,778 |
| Medium | | 8,970 | 9,060 | 9,163 | 9,258 | | 4,461 | 4,495 | 4,538 | 4,580 | | 4,510 | 4,565 | 4,625 | 4,678 |
| Low | | 8,958 | 9,005 | 9,048 | 9,062 | | 4,454 | 4,467 | 4,479 | 4,479 | | 4,504 | 4,538 | 4,569 | 4,583 |
| Constant | | 8,970 | 9,053 | 9,144 | 9,217 | | 4,461 | 4,492 | 4,528 | 4,559 | | 4,509 | 4,562 | 4,615 | 4,658 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 689 | 608 | 623 | 666 | 714 | 353 | 313 | 320 | 343 | 367 | 336 | 295 | 302 | 323 | 346 |
| Medium | | 596 | 579 | 602 | 628 | | 306 | 298 | 310 | 323 | | 289 | 281 | 292 | 305 |
| Low | | 583 | 537 | 541 | 547 | | 300 | 276 | 279 | 282 | | 283 | 261 | 263 | 265 |
| Constant | | 595 | 573 | 589 | 606 | | 306 | 295 | 303 | 312 | | 289 | 278 | 286 | 294 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 651 | 677 | 606 | 621 | 665 | 335 | 347 | 312 | 319 | 342 | 316 | 330 | 295 | 302 | 323 |
| Medium | | | 594 | 577 | 601 | | | 305 | 297 | 309 | | | 289 | 280 | 292 |
| Low | | | 582 | 535 | 540 | | | 299 | 275 | 278 | | | 283 | 260 | 262 |
| Constant | | | 594 | 572 | 587 | | | 305 | 294 | 302 | | | 289 | 278 | 285 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 619 | 659 | 676 | 605 | 620 | 319 | 339 | 347 | 311 | 319 | 301 | 321 | 329 | 294 | 301 |
| Medium | | | | 593 | 577 | | | | 305 | 296 | | | | 288 | 280 |
| Low | | | | 581 | 535 | | | | 299 | 275 | | | | 283 | 260 |
| Constant | | | | 593 | 571 | | | | 305 | 294 | | | | 288 | 277 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 625 | 621 | 658 | 675 | 605 | 321 | 320 | 338 | 346 | 310 | 304 | 302 | 320 | 329 | 294 |
| Medium | | | | | 592 | | | | | 304 | | | | | 288 |
| Low | | | | | 580 | | | | | 298 | | | | | 282 |
| Constant | | | | | 592 | | | | | 304 | | | | | 288 |
| 20 to 24 yr | 634 | 617 | 620 | 657 | 673 | 324 | 316 | 318 | 337 | 345 | 310 | 301 | 301 | 320 | 329 |
| 25 to 29 yr | 659 | 635 | 614 | 618 | 655 | 331 | 323 | 314 | 317 | 335 | 328 | 311 | 300 | 301 | 320 |
| 30 to 34 yr | 659 | 657 | 632 | 612 | 616 | 331 | 331 | 321 | 312 | 315 | 328 | 326 | 310 | 300 | 300 |
| 35 to 39 yr | 557 | 652 | 653 | 628 | 609 | 279 | 327 | 328 | 319 | 310 | 277 | 325 | 325 | 309 | 299 |
| 40 to 44 yr | 563 | 549 | 646 | 648 | 623 | 281 | 274 | 323 | 324 | 315 | 282 | 275 | 323 | 323 | 308 |
| 45 to 49 yr | 629 | 556 | 541 | 637 | 639 | 315 | 276 | 268 | 317 | 318 | 314 | 280 | 273 | 320 | 321 |
| 50 to 54 yr | 613 | 614 | 543 | 529 | 623 | 305 | 305 | 267 | 260 | 307 | 308 | 309 | 276 | 268 | 316 |
| 55 to 59 yr | 579 | 587 | 590 | 522 | 510 | 282 | 288 | 289 | 254 | 247 | 297 | 299 | 301 | 269 | 262 |
| 60 to 64 yr | 328 | 538 | 550 | 555 | 492 | 158 | 257 | 264 | 266 | 234 | 171 | 281 | 286 | 289 | 258 |
| 65 to 69 yr | 398 | 296 | 486 | 498 | 504 | 190 | 138 | 224 | 232 | 234 | 208 | 158 | 261 | 266 | 270 |
| 70 to 74 yr | 311 | 330 | 249 | 410 | 421 | 144 | 151 | 111 | 181 | 187 | 167 | 179 | 138 | 229 | 234 |
| 75 yr and over | 332 | 387 | 428 | 402 | 496 | 142 | 164 | 178 | 163 | 199 | 190 | 223 | 250 | 240 | 297 |

# TABLE II-D.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—CZECHOSLOVAKIA, 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes |  |  |  |  | Male |  |  |  |  | Female |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 15,227 | 15,519 | 15,813 | 16,186 | 16,681 | 7,421 | 7,558 | 7,705 | 7,890 | 8,139 | 7,806 | 7,962 | 8,108 | 8,296 | 8,543 |
| Medium |  | 15,495 | 15,708 | 15,964 | 16,296 |  | 7,545 | 7,651 | 7,777 | 7,942 |  | 7,950 | 8,057 | 8,188 | 8,354 |
| Low |  | 15,471 | 15,606 | 15,752 | 15,929 |  | 7,533 | 7,599 | 7,668 | 7,754 |  | 7,938 | 8,007 | 8,084 | 8,175 |
| Constant |  | 15,496 | 15,720 | 16,004 | 16,383 |  | 7,546 | 7,657 | 7,797 | 7,986 |  | 7,950 | 8,063 | 8,207 | 8,397 |
| Under 5 yr: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,376 | 1,184 | 1,182 | 1,230 | 1,378 | 703 | 606 | 605 | 630 | 706 | 673 | 578 | 577 | 601 | 673 |
| Medium |  | 1,160 | 1,101 | 1,114 | 1,214 |  | 594 | 563 | 570 | 621 |  | 567 | 538 | 544 | 592 |
| Low |  | 1,136 | 1,022 | 1,003 | 1,059 |  | 581 | 523 | 514 | 542 |  | 555 | 499 | 490 | 517 |
| Constant |  | 1,161 | 1,112 | 1,141 | 1,261 |  | 594 | 569 | 584 | 645 |  | 567 | 543 | 557 | 615 |
| 5 to 9 yr: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,251 | 1,375 | 1,181 | 1,179 | 1,227 | 640 | 702 | 603 | 602 | 627 | 611 | 673 | 577 | 576 | 600 |
| Medium |  |  | 1,157 | 1,098 | 1,111 |  |  | 591 | 561 | 568 |  |  | 566 | 537 | 543 |
| Low |  |  | 1,133 | 1,019 | 1,001 |  |  | 579 | 521 | 512 |  |  | 554 | 498 | 489 |
| Constant |  |  | 1,157 | 1,109 | 1,139 |  |  | 591 | 567 | 582 |  |  | 566 | 542 | 556 |
| 10 to 14 yr: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,064 | 1,249 | 1,374 | 1,179 | 1,177 | 545 | 639 | 701 | 603 | 602 | 519 | 610 | 673 | 577 | 576 |
| Medium |  |  |  | 1,155 | 1,097 |  |  |  | 590 | 560 |  |  |  | 565 | 536 |
| Low |  |  |  | 1,132 | 1,018 |  |  |  | 578 | 520 |  |  |  | 553 | 498 |
| Constant |  |  |  | 1,156 | 1,108 |  |  |  | 591 | 566 |  |  |  | 565 | 542 |
| 15 to 19 yr: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,085 | 1,065 | 1,246 | 1,371 | 1,178 | 556 | 544 | 637 | 699 | 601 | 529 | 521 | 610 | 672 | 576 |
| Medium |  |  |  |  | 1,154 |  |  |  |  | 589 |  |  |  |  | 565 |
| Low |  |  |  |  | 1,130 |  |  |  |  | 577 |  |  |  |  | 553 |
| Constant |  |  |  |  | 1,154 |  |  |  |  | 589 |  |  |  |  | 565 |
| 20 to 24 yr | 1,171 | 1,083 | 1,062 | 1,243 | 1,368 | 598 | 554 | 542 | 634 | 696 | 573 | 529 | 520 | 609 | 671 |
| 25 to 29 yr | 1,278 | 1,162 | 1,079 | 1,058 | 1,239 | 651 | 592 | 551 | 539 | 631 | 627 | 570 | 528 | 519 | 608 |
| 30 to 34 yr | 1,188 | 1,265 | 1,156 | 1,074 | 1,054 | 601 | 641 | 587 | 547 | 535 | 587 | 624 | 568 | 527 | 518 |
| 35 to 39 yr | 957 | 1,177 | 1,257 | 1,148 | 1,068 | 488 | 592 | 634 | 582 | 542 | 487 | 585 | 622 | 567 | 525 |
| 40 to 44 yr | 797 | 962 | 1,164 | 1,244 | 1,137 | 393 | 478 | 583 | 624 | 573 | 403 | 484 | 582 | 619 | 564 |
| 45 to 49 yr | 867 | 781 | 944 | 1,144 | 1,222 | 425 | 382 | 465 | 568 | 609 | 442 | 399 | 479 | 576 | 613 |
| 50 to 54 yr | 888 | 839 | 758 | 917 | 1,112 | 425 | 405 | 366 | 446 | 545 | 464 | 434 | 392 | 471 | 567 |
| 55 to 59 yr | 897 | 844 | 797 | 721 | 874 | 417 | 394 | 376 | 340 | 416 | 480 | 450 | 421 | 381 | 459 |
| 60 to 64 yr | 469 | 828 | 780 | 738 | 670 | 214 | 371 | 351 | 336 | 305 | 256 | 457 | 429 | 402 | 365 |
| 65 to 69 yr | 711 | 416 | 733 | 693 | 657 | 313 | 180 | 312 | 296 | 283 | 398 | 236 | 422 | 397 | 374 |
| 70 to 74 yr | 570 | 581 | 342 | 607 | 575 | 235 | 237 | 137 | 238 | 227 | 335 | 344 | 205 | 369 | 348 |
| 75 yr and over | 640 | 707 | 758 | 639 | 746 | 218 | 240 | 255 | 206 | 241 | 422 | 467 | 502 | 433 | 505 |

## TABLE II-E.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—GERMAN DEMOCRATIC REPUBLIC, 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 16,740 | 16,764 | 16,980 | 17,205 | 17,381 | 7,839 | 7,925 | 8,119 | 8,304 | 8,453 | 8,901 | 8,839 | 8,861 | 8,900 | 8,928 |
| Medium | | 16,738 | 16,864 | 16,972 | 17,009 | | 7,912 | 8,059 | 8,185 | 8,262 | | 8,826 | 8,804 | 8,787 | 8,747 |
| Low | | 16,713 | 16,750 | 16,748 | 16,655 | | 7,899 | 8,001 | 8,070 | 8,081 | | 8,814 | 8,749 | 8,678 | 8,574 |
| Constant | | 16,737 | 16,840 | 16,904 | 16,878 | | 7,911 | 8,047 | 8,150 | 8,195 | | 8,826 | 8,793 | 8,754 | 8,683 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 1,051 | 1,215 | 1,287 | 1,208 | 1,154 | 540 | 621 | 659 | 619 | 591 | 511 | 594 | 628 | 589 | 562 |
| Medium | | 1,189 | 1,196 | 1,091 | 1,014 | | 608 | 613 | 559 | 520 | | 581 | 583 | 532 | 494 |
| Low | | 1,164 | 1,108 | 981 | 884 | | 595 | 568 | 502 | 453 | | 569 | 540 | 478 | 431 |
| Constant | | 1,188 | 1,173 | 1,046 | 951 | | 607 | 601 | 536 | 487 | | 581 | 572 | 510 | 463 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 1,004 | 1,043 | 1,211 | 1,283 | 1,205 | 515 | 534 | 619 | 657 | 617 | 490 | 509 | 592 | 626 | 588 |
| Medium | | | 1,186 | 1,193 | 1,089 | | | 606 | 611 | 558 | | | 580 | 582 | 531 |
| Low | | | 1,160 | 1,105 | 979 | | | 593 | 566 | 501 | | | 567 | 539 | 477 |
| Constant | | | 1,185 | 1,171 | 1,044 | | | 605 | 599 | 535 | | | 579 | 571 | 509 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 1,249 | 1,006 | 1,042 | 1,210 | 1,282 | 640 | 515 | 534 | 618 | 656 | 609 | 491 | 508 | 592 | 626 |
| Medium | | | | 1,185 | 1,192 | | | | 605 | 610 | | | | 579 | 582 |
| Low | | | | 1,159 | 1,104 | | | | 592 | 565 | | | | 567 | 539 |
| Constant | | | | 1,183 | 1,170 | | | | 604 | 599 | | | | 579 | 571 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 1,430 | 1,248 | 1,003 | 1,040 | 1,208 | 731 | 640 | 513 | 532 | 616 | 698 | 608 | 491 | 508 | 591 |
| Medium | | | | | 1,182 | | | | | 603 | | | | | 579 |
| Low | | | | | 1,157 | | | | | 590 | | | | | 567 |
| Constant | | | | | 1,181 | | | | | 603 | | | | | 578 |
| 20 to 24 yr | 1,314 | 1,426 | 1,243 | 1,000 | 1,036 | 675 | 729 | 635 | 510 | 529 | 639 | 697 | 608 | 490 | 507 |
| 25 to 29 yr | 1,294 | 1,297 | 1,420 | 1,238 | 996 | 665 | 665 | 724 | 632 | 507 | 630 | 632 | 695 | 607 | 489 |
| 30 to 34 yr | 859 | 1,275 | 1,291 | 1,414 | 1,233 | 435 | 651 | 660 | 720 | 628 | 424 | 624 | 631 | 694 | 605 |
| 35 to 39 yr | 1,222 | 848 | 1,267 | 1,283 | 1,406 | 613 | 428 | 646 | 655 | 714 | 608 | 420 | 622 | 629 | 692 |
| 40 to 44 yr | 1,275 | 1,203 | 839 | 1,255 | 1,272 | 640 | 601 | 422 | 637 | 647 | 636 | 602 | 417 | 618 | 625 |
| 45 to 49 yr | 1,017 | 1,250 | 1,184 | 827 | 1,237 | 507 | 623 | 588 | 414 | 625 | 510 | 627 | 595 | 413 | 612 |
| 50 to 54 yr | 931 | 988 | 1,219 | 1,155 | 808 | 413 | 488 | 603 | 570 | 402 | 518 | 501 | 616 | 586 | 407 |
| 55 to 59 yr | 867 | 892 | 951 | 1,174 | 1,114 | 323 | 390 | 463 | 573 | 542 | 544 | 502 | 487 | 601 | 572 |
| 60 to 64 yr | 524 | 810 | 838 | 892 | 1,105 | 191 | 293 | 357 | 425 | 527 | 333 | 517 | 480 | 467 | 578 |
| 65 to 69 yr | 862 | 468 | 731 | 757 | 805 | 311 | 163 | 252 | 310 | 369 | 551 | 304 | 479 | 447 | 436 |
| 70 to 74 yr | 806 | 715 | 394 | 618 | 640 | 296 | 240 | 128 | 198 | 246 | 511 | 475 | 266 | 420 | 395 |
| 75 yr and over | 1,034 | 1,080 | 1,060 | 851 | 880 | 343 | 344 | 315 | 236 | 237 | 690 | 737 | 745 | 615 | 643 |

## TABLE II-F.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—HUNGARY, 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 10,709 | 10,684 | 10,646 | 10,692 | 10,825 | 5,189 | 5,165 | 5,141 | 5,161 | 5,229 | 5,521 | 5,519 | 5,505 | 5,531 | 5,597 |
| Medium | | 10,670 | 10,585 | 10,559 | 10,592 | | 5,158 | 5,110 | 5,094 | 5,110 | | 5,512 | 5,475 | 5,466 | 5,482 |
| Low | | 10,657 | 10,525 | 10,432 | 10,370 | | 5,151 | 5,079 | 5,029 | 4,996 | | 5,505 | 5,445 | 5,404 | 5,374 |
| Constant | | 10,669 | 10,568 | 10,507 | 10,479 | | 5,158 | 5,102 | 5,067 | 5,052 | | 5,512 | 5,467 | 5,440 | 5,427 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 866 | 683 | 673 | 733 | 833 | 445 | 349 | 344 | 375 | 426 | 420 | 334 | 329 | 359 | 407 |
| Medium | | 670 | 625 | 662 | 732 | | 342 | 319 | 338 | 374 | | 328 | 306 | 323 | 358 |
| Low | | 656 | 579 | 594 | 637 | | 335 | 296 | 304 | 326 | | 321 | 263 | 290 | 311 |
| Constant | | 669 | 610 | 626 | 672 | | 342 | 311 | 320 | 344 | | 327 | 298 | 306 | 328 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 773 | 863 | 681 | 671 | 731 | 398 | 444 | 347 | 342 | 373 | 375 | 419 | 333 | 328 | 358 |
| Medium | | | 667 | 623 | 660 | | | 340 | 318 | 337 | | | 327 | 305 | 323 |
| Low | | | 654 | 577 | 592 | | | 333 | 294 | 302 | | | 320 | 282 | 290 |
| Constant | | | 666 | 607 | 624 | | | 340 | 310 | 318 | | | 326 | 297 | 305 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 703 | 771 | 862 | 680 | 670 | 363 | 397 | 443 | 347 | 342 | 340 | 375 | 419 | 333 | 328 |
| Medium | | | | 666 | 622 | | | | 340 | 317 | | | | 326 | 305 |
| Low | | | | 653 | 576 | | | | 333 | 294 | | | | 320 | 282 |
| Constant | | | | 665 | 607 | | | | 339 | 310 | | | | 326 | 297 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 650 | 701 | 770 | 860 | 678 | 335 | 361 | 396 | 441 | 346 | 316 | 340 | 374 | 418 | 333 |
| Medium | | | | | 665 | | | | | 339 | | | | | 326 |
| Low | | | | | 651 | | | | | 332 | | | | | 320 |
| Constant | | | | | 664 | | | | | 338 | | | | | 326 |
| 20 to 24 yr | 814 | 648 | 699 | 767 | 857 | 415 | 333 | 359 | 394 | 439 | 399 | 315 | 339 | 374 | 418 |
| 25 to 29 yr | 892 | 810 | 645 | 696 | 764 | 452 | 412 | 330 | 357 | 391 | 439 | 398 | 314 | 339 | 373 |
| 30 to 34 yr | 756 | 885 | 805 | 641 | 692 | 381 | 448 | 408 | 328 | 354 | 375 | 438 | 396 | 313 | 338 |
| 35 to 39 yr | 721 | 748 | 877 | 797 | 635 | 359 | 376 | 442 | 403 | 323 | 362 | 372 | 435 | 394 | 312 |
| 40 to 44 yr | 652 | 708 | 736 | 863 | 785 | 313 | 350 | 367 | 432 | 394 | 339 | 358 | 369 | 431 | 391 |
| 45 to 49 yr | 685 | 635 | 690 | 718 | 843 | 331 | 302 | 337 | 354 | 417 | 354 | 333 | 353 | 364 | 426 |
| 50 to 54 yr | 694 | 658 | 610 | 664 | 692 | 330 | 312 | 285 | 319 | 336 | 364 | 345 | 326 | 345 | 356 |
| 55 to 59 yr | 674 | 652 | 620 | 576 | 628 | 309 | 302 | 286 | 262 | 294 | 365 | 350 | 333 | 314 | 334 |
| 60 to 64 yr | 381 | 616 | 597 | 568 | 530 | 170 | 272 | 267 | 253 | 232 | 210 | 344 | 331 | 315 | 298 |
| 65 to 69 yr | 547 | 333 | 542 | 526 | 502 | 238 | 142 | 227 | 223 | 212 | 309 | 191 | 315 | 303 | 290 |
| 70 to 74 yr | 416 | 444 | 273 | 444 | 432 | 173 | 179 | 108 | 172 | 170 | 243 | 264 | 165 | 271 | 262 |
| 75 yr and over | 486 | 527 | 568 | 488 | 552 | 176 | 186 | 195 | 160 | 179 | 309 | 341 | 373 | 328 | 373 |

## TABLE 11-G.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—POLAND, 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explantion of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 35,413 | 37,162 | 38,782 | 40,156 | 41,492 | 17,254 | 18,121 | 18,934 | 19,619 | 20,283 | 18,160 | 19,041 | 19,848 | 20,537 | 21,209 |
| Medium | | 37,091 | 38,488 | 39,575 | 40,533 | | 18,085 | 18,783 | 19,321 | 19,792 | | 19,006 | 19,705 | 20,254 | 20,741 |
| Low | | 37,020 | 38,201 | 39,015 | 39,620 | | 18,049 | 18,636 | 19,034 | 19,324 | | 18,971 | 19,565 | 19,981 | 20,296 |
| Constant | | 37,096 | 38,595 | 39,900 | 41,213 | | 18,088 | 18,838 | 19,488 | 20,141 | | 19,009 | 19,757 | 20,413 | 21,073 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 3,220 | 3,450 | 3,328 | 3,122 | 3,201 | 1,647 | 1,766 | 1,705 | 1,600 | 1,642 | 1,572 | 1,684 | 1,623 | 1,522 | 1,559 |
| Medium | | 3,379 | 3,105 | 2,834 | 2,822 | | 1,730 | 1,591 | 1,453 | 1,447 | | 1,649 | 1,514 | 1,381 | 1,375 |
| Low | | 3,308 | 2,899 | 2,560 | 2,467 | | 1,693 | 1,480 | 1,312 | 1,265 | | 1,614 | 1,409 | 1,248 | 1,202 |
| Constant | | 3,384 | 3,207 | 3,053 | 3,178 | | 1,732 | 1,643 | 1,565 | 1,630 | | 1,652 | 1,564 | 1,488 | 1,548 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 2,813 | 3,204 | 3,439 | 3,319 | 3,114 | 1,439 | 1,638 | 1,759 | 1,699 | 1,595 | 1,374 | 1,566 | 1,680 | 1,620 | 1,519 |
| Medium | | | 3,368 | 3,096 | 2,827 | | | 1,722 | 1,585 | 1,448 | | | 1,645 | 1,511 | 1,379 |
| Low | | | 3,297 | 2,881 | 2,554 | | | 1,696 | 1,475 | 1,308 | | | 1,611 | 1,406 | 1,246 |
| Constant | | | 3,373 | 3,198 | 3,045 | | | 1,725 | 1,637 | 1,560 | | | 1,648 | 1,561 | 1,485 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 2,517 | 2,803 | 3,200 | 3,435 | 3,315 | 1,287 | 1,434 | 1,636 | 1,756 | 1,697 | 1,230 | 1,369 | 1,565 | 1,679 | 1,619 |
| Medium | | | | 3,364 | 3,093 | | | | 1,720 | 1,583 | | | | 1,644 | 1,510 |
| Low | | | | 3,294 | 2,878 | | | | 1,684 | 1,473 | | | | 1,610 | 1,405 |
| Constant | | | | 3,369 | 3,194 | | | | 1,723 | 1,635 | | | | 1,647 | 1,560 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 2,825 | 2,506 | 2,798 | 3,194 | 3,429 | 1,452 | 1,280 | 1,430 | 1,631 | 1,752 | 1,373 | 1,226 | 1,368 | 1,563 | 1,677 |
| Medium | | | | | 3,359 | | | | | 1,715 | | | | | 1,643 |
| Low | | | | | 3,288 | | | | | 1,680 | | | | | 1,609 |
| Constant | | | | | 3,364 | | | | | 1,718 | | | | | 1,646 |
| 20 to 24 yr | 3,383 | 2,807 | 2,497 | 2,789 | 3,185 | 1,730 | 1,440 | 1,273 | 1,422 | 1,623 | 1,653 | 1,367 | 1,224 | 1,367 | 1,562 |
| 25 to 29 yr | 3,327 | 3,357 | 2,794 | 2,487 | 2,778 | 1,687 | 1,713 | 1,429 | 1,264 | 1,413 | 1,640 | 1,645 | 1,365 | 1,223 | 1,365 |
| 30 to 34 yr | 2,639 | 3,298 | 3,339 | 2,780 | 2,474 | 1,329 | 1,667 | 1,698 | 1,417 | 1,254 | 1,310 | 1,630 | 1,641 | 1,362 | 1,220 |
| 35 to 39 yr | 1,874 | 2,610 | 3,272 | 3,314 | 2,760 | 933 | 1,310 | 1,648 | 1,679 | 1,402 | 941 | 1,301 | 1,624 | 1,635 | 1,358 |
| 40 to 44 yr | 2,120 | 1,844 | 2,579 | 3,234 | 3,276 | 1,047 | 912 | 1,286 | 1,619 | 1,651 | 1,073 | 931 | 1,293 | 1,614 | 1,626 |
| 45 to 49 yr | 2,196 | 2,071 | 1,808 | 2,532 | 3,176 | 1,079 | 1,013 | 887 | 1,252 | 1,577 | 1,116 | 1,058 | 921 | 1,280 | 1,599 |
| 50 to 54 yr | 2,090 | 2,120 | 2,008 | 1,756 | 2,462 | 983 | 1,027 | 969 | 849 | 1,202 | 1,108 | 1,093 | 1,039 | 906 | 1,260 |
| 55 to 59 yr | 1,741 | 1,986 | 2,022 | 1,918 | 1,678 | 780 | 912 | 959 | 906 | 795 | 961 | 1,073 | 1,063 | 1,012 | 883 |
| 60 to 64 yr | 1,059 | 1,617 | 1,852 | 1,887 | 1,794 | 460 | 702 | 826 | 869 | 823 | 599 | 916 | 1,027 | 1,018 | 971 |
| 65 to 69 yr | 1,333 | 948 | 1,457 | 1,670 | 1,702 | 560 | 393 | 604 | 712 | 750 | 772 | 555 | 853 | 958 | 952 |
| 70 to 74 yr | 1,079 | 1,117 | 802 | 1,238 | 1,420 | 436 | 438 | 310 | 478 | 565 | 643 | 680 | 492 | 760 | 855 |
| 75 yr and over | 1,199 | 1,424 | 1,586 | 1,483 | 1,727 | 403 | 477 | 518 | 465 | 543 | 796 | 947 | 1,069 | 1,018 | 1,184 |

## TABLE II-H.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—ROMANIA, 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 22,133 | 22,786 | 23,451 | 24,293 | 25,138 | 10,918 | 11,245 | 11,583 | 12,011 | 12,442 | 11,215 | 11,541 | 11,868 | 12,282 | 12,696 |
| Medium | | 22,751 | 23,292 | 23,948 | 25,546 | | 11,227 | 11,502 | 11,834 | 12,138 | | 11,524 | 11,791 | 12,114 | 12,408 |
| Low | | 22,716 | 23,138 | 23,616 | 23,983 | | 11,209 | 11,422 | 11,664 | 11,849 | | 11,507 | 11,716 | 11,952 | 12,134 |
| Constant | | 22,753 | 23,323 | 24,051 | 24,766 | | 11,228 | 11,517 | 11,887 | 12,251 | | 11,525 | 11,806 | 12,164 | 12,515 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 2,015 | 1,790 | 1,802 | 2,002 | 2,084 | 1,030 | 917 | 925 | 1,028 | 1,070 | 985 | 872 | 877 | 974 | 1,014 |
| Medium | | 1,755 | 1,679 | 1,814 | 1,836 | | 899 | 862 | 932 | 943 | | 855 | 817 | 883 | 893 |
| Low | | 1,720 | 1,559 | 1,636 | 1,603 | | 882 | 801 | 840 | 823 | | 838 | 759 | 796 | 780 |
| Constant | | 1,756 | 1,708 | 1,887 | 1,953 | | 900 | 877 | 969 | 1,003 | | 856 | 831 | 918 | 950 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 1,922 | 1,996 | 1,779 | 1,792 | 1,991 | 984 | 1,021 | 911 | 919 | 1,022 | 938 | 975 | 868 | 872 | 969 |
| Medium | | | 1,744 | 1,669 | 1,804 | | | 893 | 856 | 926 | | | 851 | 813 | 878 |
| Low | | | 1,709 | 1,550 | 1,627 | | | 876 | 795 | 835 | | | 834 | 755 | 792 |
| Constant | | | 1,745 | 1,698 | 1,877 | | | 894 | 871 | 963 | | | 851 | 827 | 914 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 1,933 | 1,911 | 1,991 | 1,775 | 1,788 | 987 | 977 | 1,018 | 909 | 917 | 945 | 934 | 973 | 866 | 871 |
| Medium | | | | 1,741 | 1,666 | | | | 891 | 854 | | | | 849 | 812 |
| Low | | | | 1,706 | 1,547 | | | | 873 | 793 | | | | 833 | 754 |
| Constant | | | | 1,742 | 1,695 | | | | 892 | 869 | | | | 850 | 826 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 1,436 | 1,925 | 1,907 | 1,987 | 1,772 | 735 | 981 | 974 | 1,015 | 906 | 701 | 943 | 933 | 972 | 865 |
| Medium | | | | | 1,737 | | | | | 889 | | | | | 848 |
| Low | | | | | 1,702 | | | | | 871 | | | | | 832 |
| Constant | | | | | 1,738 | | | | | 889 | | | | | 849 |
| 20 to 24 yr | 1,801 | 1,446 | 1,917 | 1,900 | 1,980 | 918 | 739 | 976 | 969 | 1,010 | 883 | 707 | 941 | 931 | 970 |
| 25 to 29 yr | 1,768 | 1,777 | 1,439 | 1,908 | 1,891 | 900 | 902 | 734 | 970 | 963 | 868 | 875 | 705 | 939 | 929 |
| 30 to 34 yr | 1,424 | 1,743 | 1,766 | 1,431 | 1,898 | 723 | 881 | 895 | 728 | 963 | 701 | 862 | 871 | 702 | 936 |
| 35 to 39 yr | 1,280 | 1,416 | 1,728 | 1,752 | 1,420 | 640 | 711 | 871 | 885 | 721 | 640 | 705 | 857 | 867 | 699 |
| 40 to 44 yr | 1,536 | 1,272 | 1,398 | 1,706 | 1,730 | 764 | 631 | 699 | 855 | 870 | 772 | 640 | 699 | 851 | 861 |
| 45 to 49 yr | 1,496 | 1,508 | 1,247 | 1,372 | 1,675 | 745 | 744 | 614 | 681 | 834 | 752 | 764 | 632 | 691 | 841 |
| 50 to 54 yr | 1,400 | 1,443 | 1,463 | 1,211 | 1,334 | 687 | 712 | 714 | 590 | 656 | 713 | 732 | 748 | 620 | 678 |
| 55 to 59 yr | 1,175 | 1,323 | 1,378 | 1,398 | 1,159 | 538 | 640 | 669 | 672 | 556 | 637 | 683 | 709 | 726 | 603 |
| 60 to 64 yr | 659 | 1,093 | 1,235 | 1,288 | 1,311 | 286 | 492 | 585 | 612 | 617 | 373 | 601 | 650 | 676 | 694 |
| 65 to 69 yr | 891 | 586 | 983 | 1,111 | 1,161 | 392 | 248 | 429 | 511 | 536 | 499 | 339 | 554 | 600 | 626 |
| 70 to 74 yr | 680 | 739 | 491 | 827 | 935 | 298 | 313 | 198 | 346 | 412 | 381 | 426 | 293 | 481 | 523 |
| 75 yr and over | 717 | 818 | 928 | 834 | 1,007 | 291 | 335 | 371 | 321 | 389 | 425 | 484 | 558 | 513 | 618 |

## TABLE II-1.—ESTIMATED AND PROJECTED POPULATION, BY 5-YR AGE GROUPS AND SEX—YUGOSLAVIA, 1980–2000

[Numbers in thousands as of Jan. 1, figures may not add to totals due to rounding, see text for an explanation of the series]

| Age and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| All ages: | | | | | | | | | | | | | | | |
| High | 22,218 | 23,112 | 24,042 | 24,964 | 25,819 | 10,981 | 11,430 | 11,904 | 12,372 | 12,809 | 11,237 | 11,682 | 12,138 | 12,592 | 13,010 |
| Medium | | 23,073 | 23,869 | 24,605 | 25,221 | | 11,410 | 11,814 | 12,187 | 12,501 | | 11,663 | 12,055 | 12,418 | 12,720 |
| Low | | 23,034 | 23,700 | 24,260 | 24,652 | | 11,390 | 11,727 | 12,009 | 12,208 | | 11,644 | 11,973 | 12,251 | 12,445 |
| Constant | | 23,074 | 23,889 | 24,668 | 25,351 | | 11,410 | 11,825 | 12,219 | 12,568 | | 11,663 | 12,064 | 12,449 | 12,783 |
| Under 5 yr: | | | | | | | | | | | | | | | |
| High | 1,882 | 1,873 | 1,956 | 1,972 | 2,009 | 968 | 965 | 1,008 | 1,017 | 1,036 | 914 | 908 | 947 | 955 | 972 |
| Medium | | 1,834 | 1,821 | 1,786 | 1,769 | | 944 | 939 | 921 | 913 | | 889 | 882 | 865 | 856 |
| Low | | 1,795 | 1,691 | 1,609 | 1,544 | | 924 | 872 | 830 | 796 | | 871 | 819 | 779 | 747 |
| Constant | | 1,835 | 1,840 | 1,828 | 1,836 | | 945 | 949 | 943 | 947 | | 890 | 892 | 885 | 889 |
| 5 to 9 yr: | | | | | | | | | | | | | | | |
| High | 1,820 | 1,873 | 1,866 | 1,949 | 1,965 | 936 | 963 | 960 | 1,004 | 1,013 | 884 | 910 | 905 | 944 | 952 |
| Medium | | | 1,827 | 1,815 | 1,780 | | | 940 | 935 | 918 | | | 887 | 880 | 862 |
| Low | | | 1,788 | 1,685 | 1,604 | | | 920 | 869 | 827 | | | 868 | 817 | 777 |
| Constant | | | 1,828 | 1,834 | 1,823 | | | 941 | 945 | 940 | | | 887 | 889 | 883 |
| 10 to 14 yr: | | | | | | | | | | | | | | | |
| High | 1,821 | 1,816 | 1,870 | 1,863 | 1,946 | 934 | 934 | 961 | 959 | 1,003 | 887 | 882 | 909 | 904 | 944 |
| Medium | | | | 1,824 | 1,813 | | | | 939 | 934 | | | | 886 | 879 |
| Low | | | | 1,786 | 1,683 | | | | 919 | 867 | | | | 867 | 816 |
| Constant | | | | 1,825 | 1,832 | | | | 939 | 944 | | | | 886 | 888 |
| 15 to 19 yr: | | | | | | | | | | | | | | | |
| High | 1,860 | 1,816 | 1,812 | 1,867 | 1,860 | 952 | 931 | 931 | 959 | 957 | 907 | 885 | 881 | 908 | 904 |
| Medium | | | | | 1,822 | | | | | 937 | | | | | 885 |
| Low | | | | | 1,783 | | | | | 917 | | | | | 866 |
| Constant | | | | | 1,822 | | | | | 937 | | | | | 885 |
| 20 to 24 yr | 1,876 | 1,852 | 1,810 | 1,807 | 1,862 | 961 | 947 | 927 | 928 | 955 | 915 | 905 | 884 | 880 | 907 |
| 25 to 29 yr | 1,891 | 1,866 | 1,845 | 1,804 | 1,801 | 972 | 954 | 942 | 921 | 923 | 919 | 912 | 903 | 883 | 879 |
| 30 to 34 yr | 1,564 | 1,880 | 1,857 | 1,836 | 1,796 | 797 | 964 | 948 | 935 | 915 | 767 | 916 | 910 | 901 | 881 |
| 35 to 39 yr | 1,324 | 1,551 | 1,866 | 1,845 | 1,825 | 665 | 788 | 955 | 939 | 927 | 659 | 763 | 912 | 906 | 898 |
| 40 to 44 yr | 1,530 | 1,308 | 1,534 | 1,847 | 1,827 | 765 | 654 | 777 | 941 | 926 | 765 | 654 | 758 | 906 | 901 |
| 45 to 49 yr | 1,553 | 1,502 | 1,285 | 1,510 | 1,818 | 773 | 746 | 639 | 760 | 921 | 780 | 756 | 647 | 750 | 898 |
| 50 to 54 yr | 1,381 | 1,508 | 1,460 | 1,251 | 1,472 | 655 | 743 | 718 | 615 | 733 | 726 | 765 | 742 | 636 | 739 |
| 55 to 59 yr | 1,078 | 1,320 | 1,443 | 1,400 | 1,200 | 472 | 615 | 699 | 677 | 581 | 606 | 704 | 744 | 723 | 620 |
| 60 to 64 yr | 560 | 1,008 | 1,236 | 1,352 | 1,314 | 243 | 431 | 563 | 640 | 621 | 317 | 578 | 673 | 712 | 693 |
| 65 to 69 yr | 786 | 506 | 910 | 1,116 | 1,223 | 344 | 212 | 375 | 492 | 560 | 442 | 294 | 535 | 625 | 662 |
| 70 to 74 yr | 607 | 653 | 427 | 770 | 946 | 270 | 272 | 170 | 301 | 397 | 337 | 381 | 256 | 468 | 548 |
| 75 yr and over | 684 | 780 | 864 | 775 | 953 | 275 | 311 | 332 | 284 | 340 | 410 | 469 | 532 | 491 | 612 |

## TABLE III.—ESTIMATED AND PROJECTED POPULATION OF PRESCHOOL AGE (0 TO 6 YRS), BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding; see text for an explanation of the series]

| Country and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| Eastern Europe: | | | | | | | | | | | | | | | |
| High | 15,756 | 15,730 | 15,781 | 15,824 | 16,326 | 8,076 | 8,062 | 8,094 | 8,120 | 8,380 | 7,681 | 7,668 | 7,687 | 7,704 | 7,945 |
| Medium | | 15,501 | 14,785 | 14,420 | 14,466 | | 7,944 | 7,583 | 7,399 | 7,426 | | 7,557 | 7,202 | 7,021 | 7,040 |
| Low | | 15,273 | 13,813 | 13,082 | 12,716 | | 7,827 | 7,085 | 6,713 | 6,527 | | 7,446 | 6,729 | 6,369 | 6,189 |
| Constant | | 15,512 | 14,958 | 14,873 | 15,236 | | 7,950 | 7,672 | 7,632 | 7,821 | | 7,562 | 7,286 | 7,241 | 7,415 |
| Albania: | | | | | | | | | | | | | | | |
| High | 460 | 498 | 560 | 574 | 560 | 236 | 255 | 287 | 294 | 287 | 224 | 242 | 273 | 279 | 273 |
| Medium | | 490 | 528 | 530 | 506 | | 251 | 271 | 272 | 260 | | 238 | 257 | 258 | 246 |
| Low | | 482 | 495 | 487 | 451 | | 247 | 254 | 250 | 232 | | 235 | 241 | 237 | 220 |
| Constant | | 494 | 576 | 651 | 708 | | 254 | 295 | 334 | 364 | | 241 | 280 | 317 | 345 |
| Bulgaria: | | | | | | | | | | | | | | | |
| High | 961 | 870 | 866 | 918 | 986 | 493 | 447 | 445 | 472 | 508 | 468 | 423 | 420 | 446 | 479 |
| Medium | | 858 | 810 | 834 | 872 | | 441 | 417 | 429 | 449 | | 417 | 393 | 405 | 423 |
| Low | | 846 | 755 | 755 | 765 | | 435 | 389 | 388 | 394 | | 411 | 367 | 366 | 371 |
| Constant | | 858 | 804 | 818 | 844 | | 441 | 413 | 421 | 435 | | 417 | 390 | 397 | 410 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| High | 1,926 | 1,723 | 1,658 | 1,700 | 1,886 | 985 | 881 | 848 | 870 | 965 | 941 | 842 | 810 | 830 | 921 |
| Medium | | 1,698 | 1,553 | 1,548 | 1,669 | | 868 | 794 | 792 | 854 | | 830 | 759 | 756 | 815 |
| Low | | 1,675 | 1,451 | 1,403 | 1,466 | | 856 | 742 | 718 | 750 | | 819 | 709 | 685 | 716 |
| Constant | | 1,699 | 1,566 | 1,582 | 1,730 | | 869 | 801 | 809 | 885 | | 831 | 765 | 773 | 844 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| High | 1,402 | 1,672 | 1,791 | 1,719 | 1,620 | 720 | 855 | 917 | 881 | 830 | 682 | 817 | 874 | 838 | 790 |
| Medium | | 1,646 | 1,675 | 1,562 | 1,432 | | 842 | 858 | 800 | 734 | | 804 | 817 | 762 | 698 |
| Low | | 1,621 | 1,562 | 1,413 | 1,255 | | 829 | 800 | 724 | 643 | | 792 | 762 | 689 | 612 |
| Constant | | 1,645 | 1,651 | 1,505 | 1,348 | | 842 | 846 | 771 | 691 | | 803 | 806 | 734 | 657 |
| Hungary: | | | | | | | | | | | | | | | |
| High | 1,197 | 1,007 | 940 | 1,005 | 1,138 | 616 | 516 | 480 | 514 | 582 | 582 | 492 | 460 | 492 | 556 |
| Medium | | 994 | 879 | 912 | 1,005 | | 509 | 449 | 466 | 514 | | 485 | 430 | 446 | 491 |
| Low | | 980 | 819 | 823 | 880 | | 502 | 418 | 421 | 450 | | 478 | 401 | 403 | 430 |
| Constant | | 993 | 862 | 867 | 927 | | 508 | 440 | 443 | 474 | | 484 | 422 | 424 | 453 |
| Poland: | | | | | | | | | | | | | | | |
| High | 4,404 | 4,760 | 4,745 | 4,412 | 4,441 | 2,253 | 2,437 | 2,430 | 2,261 | 2,277 | 2,151 | 2,323 | 2,315 | 2,151 | 2,164 |
| Medium | | 4,688 | 4,452 | 4,028 | 3,939 | | 2,400 | 2,280 | 2,064 | 2,020 | | 2,288 | 2,172 | 1,964 | 1,919 |
| Low | | 4,618 | 4,165 | 3,662 | 3,467 | | 2,364 | 2,133 | 1,876 | 1,778 | | 2,254 | 2,032 | 1,785 | 1,689 |
| Constant | | 4,694 | 4,558 | 4,301 | 4,396 | | 2,403 | 2,334 | 2,204 | 2,254 | | 2,291 | 2,224 | 2,097 | 2,142 |
| Romania: | | | | | | | | | | | | | | | |
| High | 2,784 | 2,583 | 2,495 | 2,742 | 2,896 | 1,425 | 1,323 | 1,281 | 1,408 | 1,487 | 1,359 | 1,260 | 1,214 | 1,334 | 1,409 |
| Medium | | 2,548 | 2,337 | 2,498 | 2,566 | | 1,305 | 1,199 | 1,283 | 1,318 | | 1,243 | 1,137 | 1,216 | 1,248 |
| Low | | 2,513 | 2,183 | 2,266 | 2,255 | | 1,287 | 1,120 | 1,163 | 1,158 | | 1,226 | 1,062 | 1,102 | 1,097 |
| Constant | | 2,549 | 2,368 | 2,588 | 2,717 | | 1,306 | 1,215 | 1,329 | 1,395 | | 1,243 | 1,152 | 1,259 | 1,322 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| High | 2,622 | 2,617 | 2,726 | 2,754 | 2,798 | 1,348 | 1,347 | 1,405 | 1,420 | 1,443 | 1,274 | 1,270 | 1,321 | 1,334 | 1,355 |
| Medium | | 2,578 | 2,553 | 2,508 | 2,478 | | 1,327 | 1,316 | 1,293 | 1,278 | | 1,251 | 1,237 | 1,215 | 1,200 |
| Low | | 2,540 | 2,384 | 2,274 | 2,177 | | 1,307 | 1,229 | 1,172 | 1,123 | | 1,232 | 1,155 | 1,101 | 1,054 |
| Constant | | 2,579 | 2,573 | 2,561 | 2,565 | | 1,328 | 1,326 | 1,321 | 1,323 | | 1,252 | 1,246 | 1,241 | 1,242 |

## TABLE IV.—ESTIMATED AND PROJECTED POPULATION OF PRIMARY SCHOOL AGE (7 to 14 YRS), BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1980–2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding, see text for an explanation of the series]

| Country and series | Both sexes |  |  |  |  | Male |  |  |  |  | Female |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| Eastern Europe: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 16,454 | 17,338 | 17,937 | 17,840 | 17,947 | 8,431 | 8,880 | 9,182 | 9,137 | 9,200 | 8,023 | 8,458 | 8,755 | 8,703 | 8,747 |
| Medieum |  |  |  | 17,188 | 16,583 |  |  |  | 8,803 | 8,501 |  |  |  | 8,385 | 8,082 |
| Low |  |  |  | 16,547 | 15,271 |  |  |  | 8,475 | 7,829 |  |  |  | 8,072 | 7,443 |
| Constant |  |  |  | 17,272 | 16,935 |  |  |  | 8,846 | 8,682 |  |  |  | 8,426 | 8,254 |
| Albania: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 509 | 521 | 532 | 597 | 642 | 261 | 267 | 272 | 306 | 329 | 248 | 254 | 259 | 291 | 313 |
| Medium |  |  |  | 576 | 599 |  |  |  | 295 | 307 |  |  |  | 281 | 292 |
| Low |  |  |  | 554 | 557 |  |  |  | 284 | 285 |  |  |  | 270 | 271 |
| Constant |  |  |  | 600 | 693 |  |  |  | 308 | 355 |  |  |  | 293 | 338 |
| Bulgaria: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 999 | 1,074 | 1,039 | 975 | 1,012 | 514 | 551 | 533 | 501 | 521 | 485 | 522 | 506 | 474 | 492 |
| Medium |  |  |  | 939 | 933 |  |  |  | 482 | 480 |  |  |  | 456 | 453 |
| Low |  |  |  | 903 | 857 |  |  |  | 464 | 441 |  |  |  | 439 | 416 |
| Constant |  |  |  | 936 | 920 |  |  |  | 481 | 473 |  |  |  | 455 | 447 |
| Czechoslovakia: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,765 | 2,086 | 2,078 | 1,888 | 1,897 | 903 | 1,066 | 1,061 | 965 | 969 | 862 | 1,020 | 1,017 | 923 | 928 |
| Medium |  |  |  | 1,819 | 1,752 |  |  |  | 929 | 895 |  |  |  | 890 | 857 |
| Low |  |  |  | 1,751 | 1,612 |  |  |  | 895 | 824 |  |  |  | 857 | 788 |
| Constant |  |  |  | 1,825 | 1,778 |  |  |  | 932 | 909 |  |  |  | 893 | 869 |
| German Democratic Republic: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,902 | 1,592 | 1,748 | 1,982 | 2,021 | 975 | 815 | 894 | 1,013 | 1,035 | 927 | 777 | 854 | 969 | 987 |
| Medium |  |  |  | 1,906 | 1,863 |  |  |  | 975 | 954 |  |  |  | 932 | 909 |
| Low |  |  |  | 1,832 | 1,711 |  |  |  | 937 | 876 |  |  |  | 896 | 835 |
| Constant |  |  |  | 1,895 | 1,816 |  |  |  | 969 | 930 |  |  |  | 926 | 886 |
| Hungary: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 1,144 | 1,311 | 1,275 | 1,078 | 1,096 | 590 | 674 | 654 | 550 | 559 | 554 | 637 | 622 | 528 | 537 |
| Medium |  |  |  | 1,039 | 1,009 |  |  |  | 530 | 515 |  |  |  | 509 | 494 |
| Low |  |  |  | 1,000 | 926 |  |  |  | 510 | 472 |  |  |  | 490 | 453 |
| Constant |  |  |  | 1,031 | 975 |  |  |  | 526 | 497 |  |  |  | 505 | 477 |
| Poland: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High | 4,146 | 4,698 | 5,222 | 5,464 | 5,188 | 2,121 | 2,401 | 2,669 | 2,794 | 2,656 | 2,025 | 2,296 | 2,553 | 2,669 | 2,532 |
| Medium |  |  |  | 5,267 | 4,803 |  |  |  | 2,694 | 2,459 |  |  |  | 2,573 | 2,344 |
| Low |  |  |  | 5,073 | 4,432 |  |  |  | 2,595 | 2,269 |  |  |  | 2,479 | 2,163 |
| Constant |  |  |  | 5,318 | 5,020 |  |  |  | 2,720 | 2,570 |  |  |  | 2,598 | 2,450 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Romania: | | | | | | | | | | | | | | | |
| High | 3,087 | 3,114 | 3,077 | 2,827 | 2,967 | 1,577 | 1,592 | 1,574 | 1,448 | 1,522 | 1,510 | 1,522 | 1,504 | 1,378 | 1,445 |
| Medium | | | | 2,726 | 2,740 | | | | 1,396 | 1,405 | | | | 1,329 | 1,335 |
| Low | | | | 2,626 | 2,522 | | | | 1,345 | 1,294 | | | | 1,281 | 1,229 |
| Constant | | | | 2,740 | 2,808 | | | | 1,404 | 1,440 | | | | 1,336 | 1,368 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| High | 2,902 | 2,944 | 2,966 | 3,030 | 3,122 | 1,490 | 1,514 | 1,524 | 1,560 | 1,609 | 1 412 | 1,431 | 1,441 | 1,470 | 1,513 |
| Medium | | | | 2,917 | 2,884 | | | | 1,502 | 1,486 | | | | 1,415 | 1,398 |
| Low | | | | 2,806 | 2,654 | | | | 1,445 | 1,368 | | | | 1,362 | 1,286 |
| Constant | | | | 2,926 | 2,925 | | | | 1,507 | 1,507 | | | | 1,420 | 1,418 |

## TABLE V.—ESTIMATED AND PROJECTED POPULATION OF WORKING AGE (15 TO 64 YRS), BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1980–2000

[Numbers in thousands as of Jan. 1: figures may not add to totals due to rounding, see text for an explanation of the series]

| Country and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| Eastern Europe: | | | | | | | | | | | | | | | |
| High | 86,496 | 90,869 | 93,195 | 95,750 | 97,902 | 42,753 | 45,042 | 46,480 | 47,919 | 49,059 | 43,744 | 45,827 | 46,715 | 47,831 | 48,843 |
| Medium | | | | | 97,675 | | | | | 48,943 | | | | | 48,733 |
| Low | | | | | 97,450 | | | | | 48,827 | | | | | 48,623 |
| Constant | | | | | 97,686 | | | | | 48,948 | | | | | 48,738 |
| Albania: | | | | | | | | | | | | | | | |
| High | 1,536 | 1,765 | 2,003 | 2,221 | 2,458 | 797 | 913 | 1,034 | 1,143 | 1,260 | 739 | 852 | 969 | 1,078 | 1,198 |
| Medium | | | | | 2,450 | | | | | 1,256 | | | | | 1,194 |
| Low | | | | | 2,443 | | | | | 1,252 | | | | | 1,190 |
| Constant | | | | | 2,455 | | | | | 1,259 | | | | | 1,196 |
| Bulgaria: | | | | | | | | | | | | | | | |
| High | 5,846 | 6,026 | 6,048 | 6,080 | 6,044 | 2,927 | 3,016 | 3,032 | 3,051 | 3,038 | 2,920 | 3,010 | 3,016 | 3,029 | 3,006 |
| Medium | | | | | 6,032 | | | | | 3,031 | | | | | 3,000 |
| Low | | | | | 6,020 | | | | | 3,025 | | | | | 2,995 |
| Constant | | | | | 6,032 | | | | | 3,031 | | | | | 3,000 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| High | 9,615 | 10,007 | 10,244 | 10,658 | 10,920 | 4,768 | 4,954 | 5,093 | 5,315 | 5,453 | 4,848 | 5,053 | 5,151 | 5,343 | 5,468 |
| Medium | | | | | 10,896 | | | | | 5,441 | | | | | 5,456 |
| Low | | | | | 10,873 | | | | | 5,428 | | | | | 5,444 |
| Constant | | | | | 10,897 | | | | | 5,441 | | | | | 5,456 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| High | 10,734 | 11,237 | 11,255 | 11,278 | 11,414 | 5,195 | 5,508 | 5,612 | 5,666 | 5,736 | 5,540 | 5,730 | 5,643 | 5,612 | 5,678 |
| Medium | | | | | 11,389 | | | | | 5,723 | | | | | 5,666 |
| Low | | | | | 11,364 | | | | | 5,710 | | | | | 5,654 |
| Constant | | | | | 11,388 | | | | | 5,722 | | | | | 5.665 |
| Hungary: | | | | | | | | | | | | | | | |
| High | 6,919 | 7,061 | 7,048 | 7,151 | 7,105 | 3,396 | 3,468 | 3,478 | 3,543 | 3,526 | 3,523 | 3,594 | 3,570 | 3,608 | 3,578 |
| Medium | | | | | 7,091 | | | | | 3,520 | | | | | 3,572 |
| Low | | | | | 7,078 | | | | | 3,513 | | | | | 3,565 |
| Constant | | | | | 7,090 | | | | | 3,519 | | | | | 3,571 |

## TABLE V.—ESTIMATED AND PROJECTED POPULATION OF WORKING AGE (15 TO 64 YRS), BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1980–2000—Continued

[Numbers in thousands as of Jan. 1: figures may not add to totals due to rounding, see text for an explanation of the series]

| Country and series | Both sexes | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 | 1980 | 1985 | 1990 | 1995 | 2000 |
| Poland: | | | | | | | | | | | | | | | |
| High | 23,254 | 24,216 | 24,970 | 25,889 | 27,013 | 11,481 | 11,976 | 12,404 | 12,909 | 13,492 | 11,772 | 12,240 | 12,566 | 12,981 | 13,521 |
| Medium | | | | | 26,942 | | | | | 13,456 | | | | | 13,486 |
| Low | | | | | 26,872 | | | | | 13,420 | | | | | 13,452 |
| Constant | | | | | 26,947 | | | | | 13,458 | | | | | 13,489 |
| Romania: | | | | | | | | | | | | | | | |
| High | 13,975 | 14,945 | 15,477 | 15,952 | 16,171 | 6,934 | 7,435 | 7,731 | 7,978 | 8,095 | 7,041 | 7,511 | 7,746 | 7,975 | 8,076 |
| Medium | | | | | 16,136 | | | | | 8,077 | | | | | 8,059 |
| Low | | | | | 16,102 | | | | | 8,060 | | | | | 8,042 |
| Constant | | | | | 16,137 | | | | | 8,078 | | | | | 8,059 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| High | 14,617 | 15,611 | 16,150 | 16,520 | 16,777 | 7,255 | 7,774 | 8,097 | 8,315 | 8,459 | 7,362 | 7,837 | 8,053 | 8,205 | 8,318 |
| Medium | | | | | 16,738 | | | | | 8,439 | | | | | 8,300 |
| Low | | | | | 16,700 | | | | | 8,419 | | | | | 8,281 |
| Constant | | | | | 16,739 | | | | | 8,439 | | | | | 8,300 |

## TABLE VI.—ESTIMATED AND PROJECTED POPULATION OF RETIREMENT AGE (65 YRS AND OVER), BY SEX—8 EASTERN EUROPEAN COUNTRIES: 1980-2000

[Numbers in thousands as of Jan. 1; figures may not add to totals due to rounding]

| Sex and country | 1980 | 1985 | 1990 | 1995 | 2000 |
|---|---|---|---|---|---|
| Both sexes: | | | | | |
| Eastern Europe | 15,227 | 14,014 | 15,185 | 16,958 | 18,523 |
| Albania | 140 | 158 | 175 | 203 | 237 |
| Bulgaria | 1,040 | 1,013 | 1,163 | 1,310 | 1,421 |
| Czechoslovakia | 1,921 | 1,705 | 1,833 | 1,939 | 1,978 |
| German Democratic Republic | 2,702 | 2,263 | 2,185 | 2,225 | 2,325 |
| Hungary | 1,449 | 1,304 | 1,382 | 1,457 | 1,487 |
| Poland | 3,610 | 3,489 | 3,845 | 4,391 | 4,849 |
| Romania | 2,288 | 2,144 | 2,402 | 2,772 | 3,104 |
| Yugoslavia | 2,077 | 1,939 | 2,200 | 2,661 | 3,121 |
| Male: | | | | | |
| Eastern Europe | 6,108 | 5,433 | 5,825 | 6,616 | 7,389 |
| Albania | 62 | 71 | 78 | 93 | 111 |
| Bulgaria | 476 | 452 | 513 | 575 | 620 |
| Czechoslovakia | 765 | 657 | 703 | 740 | 752 |
| German Democratic Republic | 950 | 747 | 695 | 744 | 852 |
| Hungary | 587 | 508 | 530 | 555 | 561 |
| Poland | 1,399 | 1,307 | 1,431 | 1,655 | 1,858 |
| Romania | 981 | 895 | 998 | 1,177 | 1,337 |
| Yugoslvaia | 888 | 795 | 877 | 1,077 | 1,298 |
| Female: | | | | | |
| Eastern Europe | 9,118 | 8,581 | 9,360 | 10,342 | 11,135 |
| Albania | 78 | 87 | 97 | 110 | 126 |
| Bulgaria | 565 | 560 | 650 | 735 | 801 |
| Czechoslovakia | 1,155 | 1,047 | 1,130 | 1,199 | 1,227 |
| German Democratic Republic | 1,752 | 1,515 | 1,490 | 1,481 | 1,474 |
| Hungary | 862 | 797 | 853 | 902 | 925 |
| Poland | 2,211 | 2,181 | 2,414 | 2,736 | 2,991 |
| Romania | 1,306 | 1,249 | 1,404 | 1,594 | 1,767 |
| Yugoslvaia | 1,189 | 1,144 | 1,323 | 1,583 | 1,823 |

# II. ENERGY

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## OVERVIEW: EAST EUROPEAN ENERGY

By Ronnie L. Goldberg*

The four papers in this section deal variously with East European imports of OPEC oil; energy policy and conservation; the generation, consumption, and allocation of electric power; and the region's energy prospects for the remainder of the decade. The papers are diverse in both focus and style, but taken together they illuminate the relationships between three key themes which help to explain Eastern Europe's current energy problems and define its options. These themes are:

The dominant role of the Soviet Union in shaping Eastern Europe's energy situation;

The impact of Eastern Europe's slowing economic growth rate on its present energy situation and future choices;

And prospective impact of regional integration on CMEA energy performance.

It is clearly impossible to understand East European energy problems and prospects without first appreciating the enormous degree to which the Soviet Union has influenced the structure, goals, and performance of the region's energy sector. In his article on "Soviet Energy Policy in Eastern Europe" [1] John P. Hardt chronicles the ways in which Soviet leaders since Stalin have appreciated the critical role Soviet energy could play in Eastern Europe and consequently attempted to use it as a "key lever" of Soviet political control in the area.

Soviet policies at first promoted autarchy, a strategy which depended on deliveries of cheap and abundant Soviet hydrocarbons. The decline in the rate of growth of Soviet oil production, together with the necessity of raising hard currency through oil sales outside CMEA, have ended this era. Having once deliberately set out to promote the energy dependence of Eastern Europe, the USSR has found itself in the difficult position of having to weigh a complex set of competing economic and political demands which pit East European claims to its energy against an array of Soviet domestic and foreign policy priorities. Oil deliveries to Eastern Europe have accordingly been carefully calibrated and Eastern Europe's access to Soviet oil has been restricted.

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*Vice President, New York City Chamber of Commerce and Industry.

[1] John P. Hardt, "Soviet Energy Policy in Eastern Europe," in Sarah M. Terry, ed., "Soviet Policy in Eastern Europe" (New Haven: Yale University Press), 1984.

Thus, despite rapidly escalating OPEC prices, the USSR chose to force its East European clients into a growing reliance on OPEC oil. The economic and political implications of this move for the countries of Eastern Europe have been various and complex, as C.H. McMillan's paper on "Eastern Europe's Relations with OPEC Suppliers in the 1980s" demonstrates.

East European imports of OPEC oil grew significantly over the 1970's, allowing not only some reduction in economic dependence on the USSR, but also new political opportunities in the CMEA countries' relations with Middle East and North African suppliers. The second oil price shock at the end of that decade forced reductions in oil imports at a time of severe economic stress. Now, CMEA-OPEC oil trade appears to be enjoying a revival, albeit on a new basis.

The terms of current CMEA-OPEC oil trade as described by McMillan are dictated by the severe balance of payments problems in hard currency now being experienced by most CMEA countries. East European importers obtain OPEC crude on favorable payment terms and reexport it for hard currency—a situation which does more to ameliorate balance of payment problems than to fulfill domestic energy requirements. This seems to be a temporary arrangement, but the prospects for a renewed and rising dependence on oil imported from either the USSR or OPEC are not bright. Eastern Europe appears to have no choice but to reduce the share of oil in domestic consumption.

The fact that the USSR is no longer willing to meet Eastern Europe's oil demands at concessionary prices has of course contributed to the slowdown in the region's economic growth. Other factors, such as the effects of Western recession and the results of chronic systemic inefficiencies, have now created a vicious circle in which the actions required to deal with energy shortfalls and bottlenecks have become increasingly difficult to implement. The implications of this situation emerge clearly from both Leslie Dienes and Victor Merkin's paper on "Energy Policy and Conservation in Eastern Europe," and Alex Wynnyczuk's "Electric Energy in Eastern Europe."

Dienes and Merkin portray a region in which current economic conditions have led to an investment crunch which threatens economic recovery and technological advance. These problems in turn seriously impair prospects for increased energy efficiency and long-term conservation. The former requires expensive replacement of obsolete capital stock and investment in new industrial technologies, neither of which is widely affordable at present. The latter demands an unlikely degree of systemic reform. Dienes and Merkin describe a wide variety of conservation policies and technologies—some more promising than others—which are in constant danger of being subverted by forces ranging from unrealistic energy price mechanisms to prevailing economic management structures.

Wynnyczuk adds another perspective to the constraints on increasing energy efficiency and the role of the energy sector in economic development. In examining the structure of electricity consumption, he notes several characteristics of electric power use in Eastern Europe that are specific to a relatively low stage of industrialization. Electric energy still constitutes a lower share of per capita energy use in Eastern Europe than in the West, and a disproportionate share of the electric power is allocated to industry. Moreover, growth in electric power consumption has declined faster in Eastern than Western Europe. One implication of these observations is that the structure of energy consumption is both partial cause and effect of lagging economic development, and that Eastern Europe will have extreme difficulties in "catching up" with the West in these respects.

The difficulties on the consumption side are compounded by even worse constraints on increasing energy production. Given hard currency constraints on purchase of OPEC oil for domestic use and even the most optimistic projections of Soviet oil and gas deliveries to CMEA, a large part of the burden of meeting incremental energy demand through the remainder of the decade must fall on East European production of coal and nuclear power. Production plans to 1990 rest almost entirely on these sectors. As Wynnyczuk points out, however, this growing dependence on nuclear power and increasing use of low quality brown coal and lignite have extremely serious environmental implications, the dangers of which are largely ignored in public discussion. In any case, production targets seem to be highly optimistic in most cases.

In their "Eastern Europe Energy Outlook through 1990," analysts from the CIA put together the supply and demand sides of this rather bleak energy picture. Once again the dominant themes which emerge are the pivotal role of future Soviet energy deliveries to the region, the economic constraints on improvements on both domestic consumption and production, and the diversity among CMEA countries in their energy prospects. For the most part, however, even with relatively optimistic projections of stable future Soviet oil deliveries, the scenarios presented in this paper offer little encouragement for prospective East European economic growth.

One approach to these problems—an approach fostered in the past by the U.S.S.R.—has been through regional integration. Cooperative efforts in building the Orenburg gas pipeline and producing equipment for nuclear power plants have attempted to increase economic and energy interdependence within Eastern Europe. These efforts have met with only limited success, and the degree of integration achieved is hardly a counterweight to the diversity in energy policies and situations among CMEA members caused by differing natural endowments, development policies, and political events.

Indeed, the cumulative effect of the body of work presented here is to induce pessimism. Eastern Europe is a region poorly endowed with natural resources, plagued by economic austerity, and constrained by rigid political and inefficient economic structures—all factors which bode ill for improving energy supply and utilization. Moreover, as the CIA analysts have pointed out, hard currency shortages, ominous demographic trends, and declining labor productivity may as much overshadow or make moot the problems posed by energy shortages as inhibit their solution. Leaving aside for the moment unlikely shifts in Soviet policy, prospects for improvement in the East European energy picture appear to rest on a combination of worldwide economic recovery and extensive domestic reform.

The role of the Soviet Union therefore becomes increasingly anomalous. As John Hardt observes, the U.S.S.R. may in fact be hostage to an energy policy lever that has lost most of its flexibility:

> Whereas in the 1970's Moscow felt constrained to limit use of its energy leverage to granting or witholding increases in deliveries because cuts in the face of spiraling world prices would have imposed an intolerable strain on the region, in the 1980s it may have no choice but to impose such cuts regardless of the consequences for the East European economies.

The net effect would seem to be that energy issues will continue to contribute to both political and economic instability in Eastern Europe.

# EAST EUROPEAN ENERGY OUTLOOK THROUGH 1990*

By Analysts of the Central Intelligence Agency

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## I. INTRODUCTION

Eastern Europe had regarded itself for some time as immune from the energy difficulties that plagued the Western economies during most of the 1970s.[1] At first, the optimism appeared justified. Access to adequate energy supplies—especially cheap Soviet oil—helped support East European economic growth of around 4 percent per annum during the five years following the 1973 onset of spiraling world oil prices.

As the decade drew to a close, however, it was clear that Eastern Europe was beginning to feel the pinch of more costly energy. In particular, the regimes were finding it necessary—

To reduce their growing dependence on imported oil;

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* Informatin as of Oct. 1, 1983, was used in preparing this paper.

[1] In this paper, Eastern Europe refers to Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. East European government sources (statistical yearbooks, trade yearbooks, plan fulfillment reports, and CEMA yearbooks) provide most of the energy statistics used in this paper. Where necessary, we have utilized UN, Soviet, Wharton Forecasting Inc., and other sources to supplement official data. For comprehensive documentation of East European energy data see "Energy Supplies in Eastern Europe: A Statistical Compilation," National Foreign Assessment Center, ER 79-10624, December 1979.

To boost domestic energy production, especially coal; and

To establish meaningful conservation programs.

Indeed, many East European specialists wrote that energy shortages would present major challenges to the regimes during the 1980s.[2] The first few years of this decade have demonstrated, however, that energy shortfalls represent just one of many factors leading to a slowdown in East European growth. (See Figures 1 and 2.) Other constraints include—

Cutbacks in Western lending and serious debt servicing problems;

Adjustment measures aimed at increasing net exports;

Declining factor productivity; and

Continued economic inefficiency as a result of systemic rigidities.

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[2] Many articles have appeared over the past few years addressing Eastern Europe's energy difficulties, including articles in earlier volumes of the Joint Economic Committee (JEC). Among these earlier papers are "The Policy Dilemmas of the East Europe's Energy Gap," John M. Kramer, in "East European Economic Assessment, Part 2—Regional Assessments" JEC, (Washington: GPO, 1981), pp. 459–475, "The Linkage Between Energy and Growth Prospects in Eastern Europe," Robin A. Watson, Ibid, pp. 476–508, and "Eastern Europe: Growing Energy Problems," John Haberstroh, in "East European Economies Post Helsinki," JEC, (Washington; GPO, 1977) pp. 379-395. A couple of other noteworthy papers dealing with this topic are "East European Energy," Jonathan P. Stern, (London: Policy Studies Institute and the Royal Institute of International Affairs, 1982), and "Eastern Europe's Resources Crises", George W. Hoffman, (University of Texas at Austin; Center for Energy Studies, January 1981).

**Figure 1**
**Eastern Europe: GNP Growth**

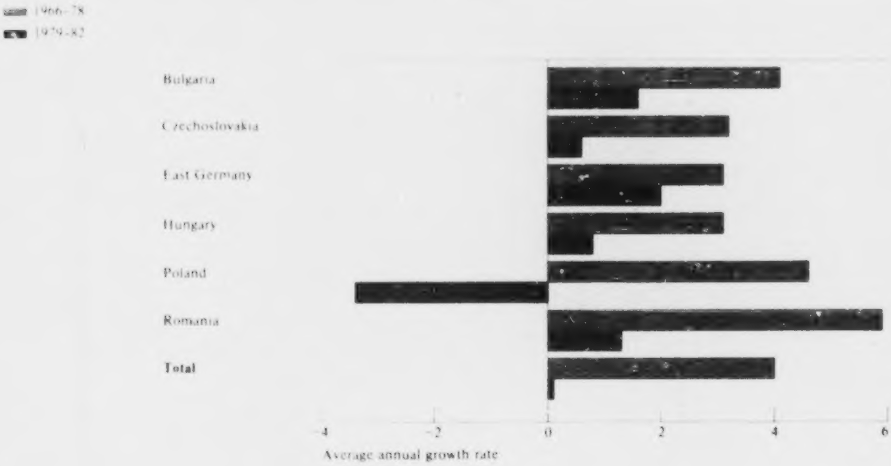

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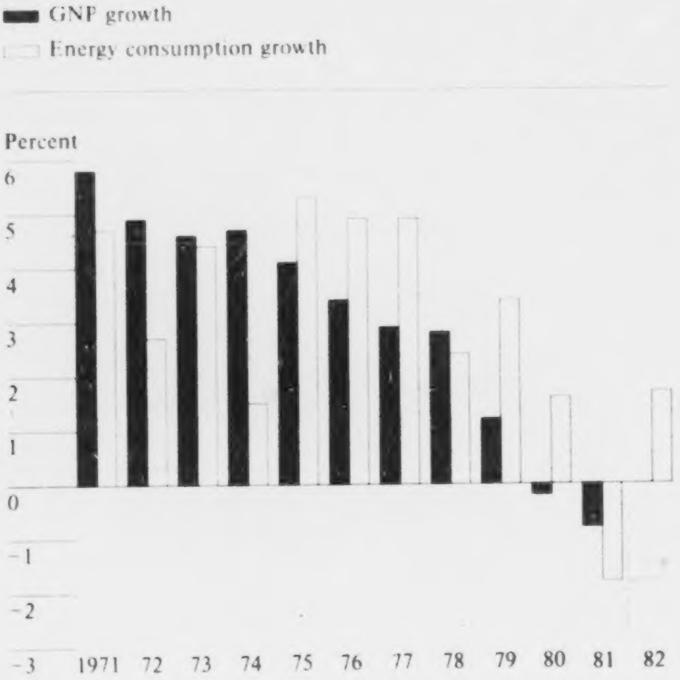
**Figure 2**
**Eastern Europe: Energy Consumption and Economic Growth**



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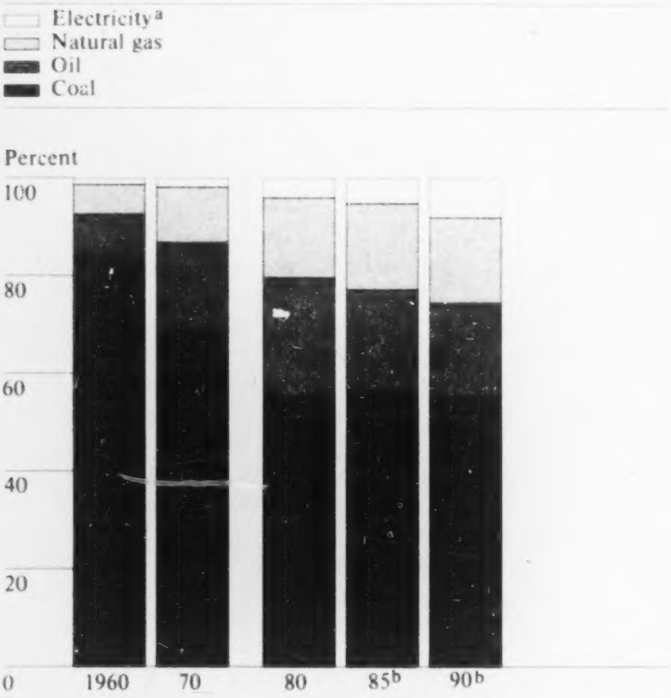
Many of these problems already preoccupy the leaderships, pushing energy difficulties into the background for the time being. Moreover, forced austerity as a result of the credit crunch has slowed markedly Eastern Europe's demand for energy. Buoyant demand for energy based on projections of a few years ago no longer holds. Nonetheless, all of the regimes continue to stress the importance of dealing with difficulties in the energy sector. Failure to ease energy scarcities will prolong bottlenecks and could inhibit economic recovery once external constraints ease.

## II. THE RISE OF OIL DEPENDENCY

One of Eastern Europe's most pressing energy needs over the current decade is to adjust to tighter oil supplies after having made a deliberate effort over the past couple of decades to reduce reliance on domestic coal and step up the consumption of oil. Coal's share in primary energy consumption fell from nearly 85 percent in 1960 to just 55 percent by 1980. (See Figure 3.) During the same period, oil's share of primary energy consumption rose from a little over 8 percent to nearly a quarter. While this level of dependence on oil is still well below Western Europe's, interruptions in supply would have a significant economic impact.

Eastern Europe accomplished this change in its energy mix largely through a dramatic rise in oil imports. (See Figure 4.) Only Romania had significant domestic supplies of oil, and even it began to boost imports sharply over the latter half of the 1970s as domestic production declined because of dwindling reserves. Thus, Eastern Europe's net oil imports of just 41,000 barrels per day (b/d) in 1960—about 1 percent of primary energy consumption—climbed to over 1.7 million b/d by 1980 or one-fifth of primary energy consumption.

**Figure 3**
**Eastern Europe: Primary Energy Consumption by Fuel**



[a] Includes hydro and nuclear power
[b] Projected

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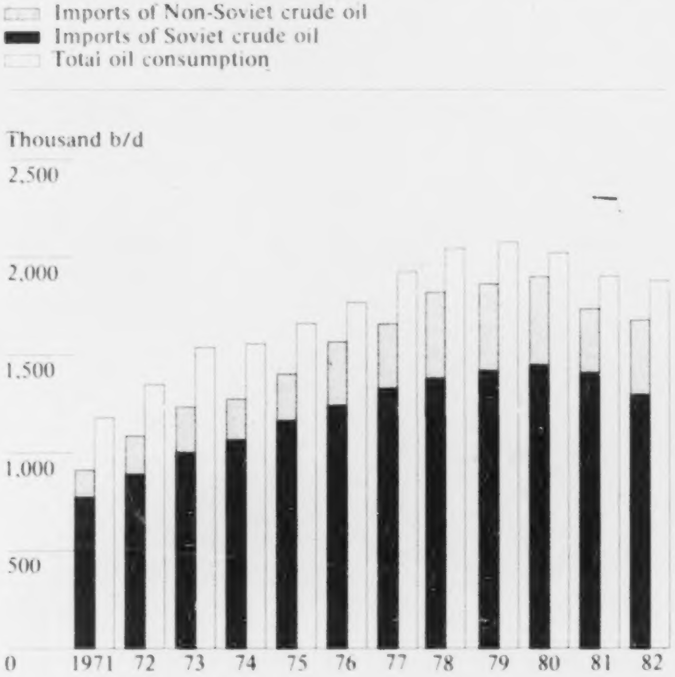
## Figure 4
## Eastern Europe: Oil Consumption and Crude Oil Imports



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The oil story dwarfed another development in the energy picture—the rise in natural gas consumption. With the completion of the Orenburg pipeline, Soviet gas exports to the area nearly doubled between 1978 and 1980, rising to nearly 30 billion cubic meters (bcm).[3] Even so, by 1980 these imports accounted for just one-third of natural gas consumption and less than 6 percent of total primary energy consumption.

### *A. The Soviet Factor*

The Soviet Union was chiefly responsible for the surge in oil imports. By 1980, net imports of Soviet oil were running at a rate of almost 1.6 million b/d, accounting for well over 90 percent of the region's total net imports of oil and about two-thirds of total energy imported from the Soviet Union. This increase in oil imports contributed to the region's growing energy dependency on the USSR. (See Figure 5.) Not only did Soviet oil deliveries rise substantially, but the terms offered Eastern Europe were quite favorable. The Soviets did not raise oil prices to Eastern Europe during the first OPEC price explosion in 1973-74 and have based prices since 1975 on average world prices for the preceding five years. This formula essentially shielded most of Eastern Europe from oil price shocks while providing a continuing subsidy throughout the period of rising world oil prices.[4]

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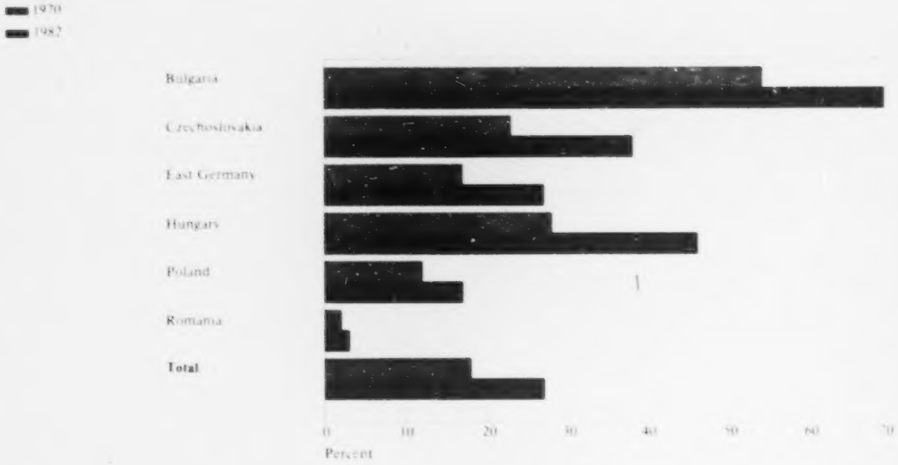
[3] For a more comprehensive look at the use of natural gas in Eastern Europe see "The Orenburg Natural Gas Project and Fuels-Energy Balances in Eastern Europe" by J. B. Hannigan, (Carleton University; Institute of Soviet and East European Studies, 1980).

[4] An excellent discussion of Soviet subsidies to Eastern Europe, especially the subsidization of energy, can be found in "Soviet Subsidization of Trade with Eastern Europe", Michael Marese, and Jan Vanous, (University of California, Berkeley: Institute of International Studies, 1983).

**Figure 5**
**Eastern Europe: Energy Imports from the USSR as a Share of Total Energy Consumption**



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Eastern Europe's access to adequate amounts of cheap Soviet oil came to an abrupt halt in the early 1980s. The region entered the current five-year plan period, 1981–85, expecting annual deliveries of oil and coal from the Soviet Union generally to be held constant at the 1980 level. Increases in alternative energy deliveries from the USSR would depend largely on the completion of several large-scale energy projects.

Eastern Europe's energy picture worsened in the fall of 1981 when Moscow informed most of the countries that it would reduce concessionary oil deliveries beginning in 1982 and probably continuing through at least 1985.[5] Annual deliveries to Czechoslovakia, East Germany, Hungary, and possibly Bulgaria were cut by around 10 percent, or by approximately 40,000 b/d each to Prague and Berlin, 30,000 b/d to Sofia, and less than 15,000 b/d to Budapest; Czechoslovakia and East Germany may have made up for part of the cutbacks by additional purchases at non-concessionary prices. The USSR apparently maintained deliveries to Poland because of its precarious economic and political situation. Warsaw reported only a minimal drop in Soviet deliveries of crude oil in 1982. Romania also was not included in this change of policy since it has never enjoyed the favorable terms offered to the rest of Eastern Europe. Bucharest has always paid world market prices in hard currency or hard goods for the small quantities of Soviet oil it has purchased. Bucharest, nonetheless, cutback purchases because of its hard currency crunch, reducing its imports of Soviet oil from 54,000 b/d in 1981 to just 7,000 b/d in 1982.

We are not certain of the rationale for the cuts, which came soon after Moscow had promised to maintain constant deliveries, but the Soviets' need for hard currency probably was the major factor. Moscow also may have believed that the East Europeans could absorb the oil reductions without jolting their domestic economies. In fact, the countries singled out by the USSR had substantially boosted oil product exports to the West in 1980 compared with 1979:

East Germany increased its oil product exports by a third to over 60,000 b/d;

Czechoslovakia doubled exports to 26,000 b/d, while Hungarian exports were up by 40 percent to nearly 17,000 b/d; and

Bulgaria, whose oil product exports were minimal during most of the 1970s, exported some 30,000 b/d in 1980.

The brisk pace of oil product exports continued in 1981 with these four countries possibly increasing exports another 10 percent. Only after the Soviet cutbacks did Eastern Europe begin easing its reexport of Soviet oil.

### *B. Few OPEC Purchases*

Current foreign exchange constraints limit Eastern Europe's ability to take much advantage of the recent drop in world oil prices to offset the cutbacks in Soviet oil deliveries.[6] Indeed, OPEC oil has never been much of a factor in Eastern Europe's switch to oil except in the case of Romania. Excluding Romania, non-Soviet crude oil imports by Eastern Europe peaked at only 182,000 b/d in 1978, accounting for less than 11 percent of total oil imports and just 3 percent of primary energy consumption.

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[5] "Soviets to Cut Oil Sales to East Europe," Paris AFP in English, 16 Nov. 1981, as reported by "FBIS Daily Report, Soviet Union," 18 Nov. 1981, p. BB1, "USSR to Reduce Crude Oil Deliveries in 1982," Hamburg DPA in German, 20 Dec. 1982, as reported in "FBIS Daily Report, Eastern europe," 28 Dec. 1981, p. E6, and "Soviet Union to Cut Oil for East Germany by 10 percent," *Financial Times*, Sept. 9, 1982.

Romania, on the other hand, sharply boosted oil imports from the Mideast and North Africa in the latter half of the 1970s. With domestic production peaking in 1976 at 294,000 b/d, Bucharest needed oil to feed its growing refining industry. Crude oil imports jumped to 319,000 b/d by 1980, triple the 1975 level, and provided nearly 60 percent of Bucharest's oil needs (consumption plus exports). Well over one-half of these imports came from just three countries: Iran, Iraq, and Libya. During this period, Romania bought small amounts of Soviet oil in an effort to diversify its suppliers, but received no financial breaks.

Some of the East European countries have attempted to take advantage of the current soft world market for oil, both to improve domestic supplies and hard currency earnings from oil sales. Hungary, for example, concluded an arrangement with Iran in late 1982 that increased crude oil imports by 20,000 b/d and thus helped to keep it active in the export market as well as to boost reserves. Before the agreement, crude oil imports had been declining steadily since 1978. Low oil prices also helped East Germany and Bulgaria boost OPEC oil imports in 1981-1983 and thus maintain their levels of oil exports. Even Poland hiked crude oil imports to 30,000 b/d in 1983, due largely to imports of 20,000 b/d of Libyan oil that were then reexported.[7]

The other two countries apparently are not making much headway out of current market conditions. Czechoslovakia apparently is keeping its annual OPEC purchases to just a couple of tankers per year at the moment, perhaps a reflection of its conservative financial policies. Romania, which saw its crude oil imports drop 35 percent in 1981-82, is likely to keep imports down as long as its financial difficulties remain.

Whatever benefits Eastern Europe manages to derive from the current drop in prices may be eroded by the negative impact of continuing low crude oil prices on the Soviet Union. In an effort to maintain hard currency earnings from oil exports, Moscow may be tempted to make further reductions in concessionary deliveries to Eastern Europe to free more oil exports for the West.

## III. DIFFICULTIES WITH DOMESTIC ENERGY PRODUCTION AND CONSERVATION

Eastern Europe has not been able to increase its own energy production enough to compensate for the tighter import picture it now faces. Intense efforts to boost production are being hindered by reduced levels of investment, cuts in imports of Western technology and equipment, and declining factor productivity. Estimated production of all energy sources in 1983 was around 6.4 million b/d (oil equivalent) or just 2.8 percent higher than 1978.

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[6] See "Eastern Europe's Relations with OPEC," Carl H. McMillan and John B. Hannigan also contained in this volume.

[7] "Oil Imports, Exports," Western Domestic Service in Polish, 17 Oct. 1983, as reported by FBIS, "Daily Report, Eastern Europe" 18 Oct. 1983, p. G14.

### A. Coal

The region was hurt by the nearly 20 percent drop in Polish hard coal production between 1979 and 1981, which led to a sharp drop in Polish coal exports to the rest of Eastern Europe. Although Polish hard coal accounted for only a small fraction of the other states' total coal consumption, the high quality of this coal was not easily replaced in certain industrial sectors and forced additional hard currency purchases. The upswing in Polish coal output that began with the imposition of martial law has helped somewhat. Production in 1982 rose by 16 percent, compared to 1981, and total exports nearly doubled. Both production and exports climbed again in 1983, with deliveries to Eastern Europe probably increasing to their pre-Solidarity level.

Elsewhere in Eastern Europe, coal production grew by only 2.0 percent per year during 1979-83, despite efforts to increase output substantially. Indeed, the rate of growth of coal production is quite erratic throughout the region. Romanian coal output has grown sharply in the past few years, but the rate of increase varies from year to year and remains well below annual targets. Hungarian coal production continues to stagnate, and while Czechoslovak coal production grew marginally in 1982-83, it is only slightly above the level produced in 1979. Bulgarian coal production fell slightly in 1981, rebounded by 8.5 percent in 1982, and rose by less than 1 percent in 1983. Lignite production in the GDR grew by well over 3 percent in both 1981 and 1982—the best performances in several years—but the pace fell to just one percent in 1983.

Despite the enormous efforts being made to increase coal extraction, the East Europeans publicly admit that the following obstacles continue to hinder output and cannot be overcome easily:

The excessive and increasing ratio of overburden to coal and the high water seepage found in lignite deposits;

The growing and often acute shortages of machinery and spare parts, especially for equipment purchased in the West;

The declining calorific content of the coal mined as hard coal deposits dwindle in all of the countries but Poland, leaving the region dependent on low quality brown coal and lignite; and

Increasing environmental concerns that can no longer be ignored.[8]

### B. Oil and Gas

The region as a whole has meager reserves of oil and gas, with Romania accounting for around three-fourths of the production of these fuels. While Romania actually boosted oil production marginally in 1981 and in 1982, halting a four-year slide, output still remains some 20,000 b/d below recent plans and 60,000 b/d below peak production in 1976 of 294,000 b/d. Bucharest also has increased natural gas output since 1979—contrary to most of its earlier plans to conserve this fuel and probably to help offset the shortfalls in other fuels. The other East European countries, for the most part, are struggling to maintain their modest production of these fuels.

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[8] "Eastern Europe Addresses New Energy Relations," "Journal of Commerce", June 22, 1982, and "The Environmental Crises and Eastern Europe, "John M. Kramer, "Slavic Review," Summer 1983, pp. 204-220.

### *C. Nuclear Power*

Nuclear power production has been the one bright spot in the energy picture over the past few years, with output doubling since 1978. Three countries—Bulgaria, Czechoslovakia, and the GDR—produce as appreciable share of their electricity from Soviet-designed nuclear power plants.[9] Sofia has been aided by additional output from two 440 Megawatt (MW) reactors that came on line in mid-1981 and now derives over a quarter of its electricity from nuclear power. Prague's two 440 MW reactors, which began operations in 1979 and 1980, provide nearly 8 percent of that country's total electricity production. The East Germans are receiving between 10-12 percent of their electricity from the four 440 NW reactors at Lubmin. As for Hungary, it connected the first reactor at Paks to the electric grid in late 1982.

The increase in the number of nuclear power plants coming on line has not obscured the fact that optimistic targets are not being met. Although electricity production has grown because of new nuclear plants, nuclear power still provides less than 3 percent of primary energy production. The nuclear program has lagged badly from the start, and some problems appear to be worsening. Czechoslovakia, a major supplier of reactor components, has publicly admitted that supplying the rest of Eastern Europe has been a burden to its economy.[10]

### *D. Inefficient Energy Use*

Despite growing problems with its energy supply, Eastern Europe has been slow to make adjustments on the demand side.[11] Throughout the latter half of the 1970s, the rise in energy consumption continued to exceed GNP growth. Relative to the developed West, Eastern Europe is notoriously inefficient in its use of energy. Per capita consumption of energy for the region as a whole exceeds that of Western Europe, for example, even though per capita GNP and living standards are noticeably lower.

The region was able to postpone serious energy conservation efforts because of increased imports of Soviet oil at concessionary prices. The initial conservation steps undertaken in the mid-1970s were weak, focusing on consumer education and introducing contests among firms to save energy in the name of "socialist competition." These programs were later supplemented with measures such as daylight savings time, reduced public lighting, alternate weekend driving, and decreeing maximum room temperatures. As the need for more serious conservation initiatives arose, the regimes overcame concern about adverse consumer reactions and sharply increased energy prices in 1979:

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[9] Much of our discussion on nuclear energy in Eastern Europe is based on the excellent article, "Soviet Policy in the Development of Nuclear Power in Eastern Europe," by Leslie J. Fox contained in "Soviet Economy in the 1980s: Problems and Prospects, Part 1," JEC (Washington: USGPO, 1982) pp. 457-508.

[10] Ibid, p. 490, and "Deputy Premier Reviews Nuclear Power Plants, Prague, Lidova Demokracit, 28 Jan. 1983, in "FBIS Daily Report, Eastern Europe," 9 Feb. 1983, p. D2, and "Communists Push Nuclear and Other Energy Efforts as Shortages Threaten Political Stability of the Bloc," "Wall Street Journal", 6 Oct. 1981, p. 6.

[11] See "Energy Policy and Conservation in Eastern Europe," Leslie Dienes and V. Merkin, also contained in this volume.

Bulgaria upped prices for gasoline by over 80 percent and for other fuels by 50 to 100 percent;

Czechoslovakia and Hungary boosted overall energy prices by 50 percent and 34 percent, respectively;

Romania hiked retail prices of energy by 50 to 100 percent; and

Poland increased the price of gasoline by 23 percent and fuel oil by 20 percent.[12]

Periodic consumer energy price adjustments—some quite substantial—are not commonplace throughout Eastern Europe and recently have spread to include even industrial energy prices. Only East Germany has remained reluctant to boost consumer energy prices, choosing instead to limit allocations.

For the most part, these Eastern European attempts at conservation have achieved only limited results. The energy-GNP ratio has not been markedly affected by conservation programs, and recent energy savings appear more the result of economic slowdown. Only East Germany—and to a lesser extent, Hungary—appear to have made some headway in this area, with GNP growth in recent years outpacing the increase in energy consumption. Elsewhere in Eastern Europe, increases in output continue to require disproportionately large increases in energy. Several factors contribute to this continuing inefficient use of energy, including:

An economic reward system based on production plan fulfillment rather than efficiency (profitability);

Outdated industrial plant and equipment installed in an era of cheap energy;

Continued heavy reliance on poor quality coal at a source of industrial energy; and

Conservation programs focusing on households and other non-industrial users, who account for only about one-fifth of total energy consumption.

## IV. ENERGY PLANS THROUGH 1990

Eastern Europe almost certainly will not overcome its energy difficulties in the near-term. Overall energy supplies (production plus net imports) probably will grow by about 1.5 percent a year through 1990 (in b/d oil equivalent or bdoe) compared to nearly 4 percent in the 1970s. Domestic production is projected to grow by 1.4 percent a year, well below ambitious targets. Net energy imports are expected to grow by nearly 2.0 percent a year, largely due to additional deliveries of natural gas and electricity from the Soviet Union over the latter half of the decade as well as declining exports of oil by Eastern Europe. Soviet oil deliveries are expected to remain flat at best, and foreign exchange constraints will continue to limit purchases of OPEC oil unless prices fall significantly. The bleak supply picture is forcing Eastern Europe to tackle problems on the demand side, and nearly all of the regimes are now focusing more closely on energy conservation. But energy savings are more likely to continue to reflect stagnant economies rather than improved efficiency. In sum, Eastern Europes pattern of primary energy consumption is unlikely to change much with the exceptions of some growth of primary electricity consumption (nuclear) at the expense of oil (See Figure 3.)

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[12] "Consumer Price Developments in Eastern Europe," Martin J. Kohn, in "East European Economic Assessment, Part 2", JEC (Washington: GPO, 1981) p. 335.

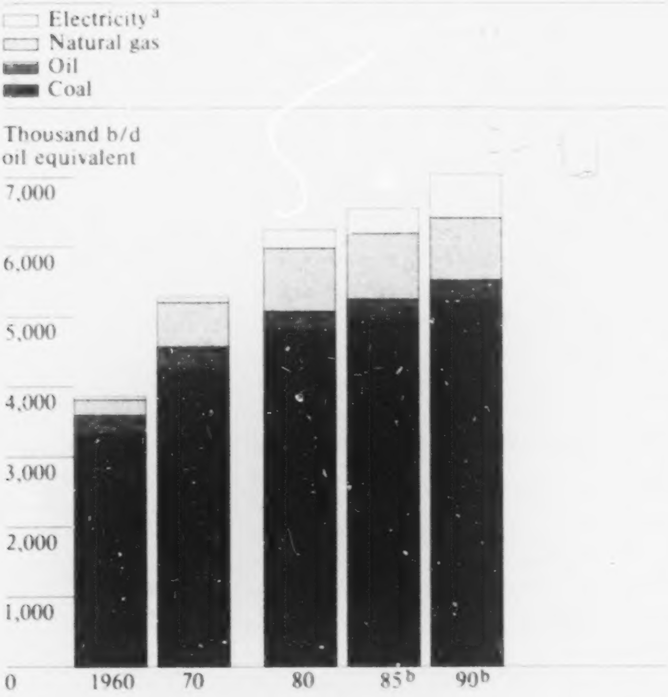
### *A. Production Prospects*

Eastern Europe's official production plans to 1990 are quite sketchy. The sometimes lengthy delays in issuing the 1981-85 plans—and the relative dearth of information once they were released—do not bode well for receiving much from the 1986-90 plans. The regimes appear hesitant to offer detailed projections, realizing how quickly circumstances change. Romania, for example, issued energy guidelines to 1990 in late 1979 stressing energy self-sufficiency as the theme. Bucharest has now upped the date for self-sufficiency to 1985, not because of any great boost in domestic production, but because oil imports dropped more sharply than anticipated.

The area's production plans rest almost entirely on increasing coal production and nuclear power capacity. Only Romania seeks to boost oil and gas production significantly—and Romania's oil fortunes hinge largely on what it will be able to extract from the Black Sea. Official East European plans project that coal production for the region will grow by about 3 percent a year through at least 1985, compared with the barely positive growth achieved during 1976-80. Bulgaria and Romania are optimistic, both projecting a doubling in coal output, Bulgaria by 1990 and Romania by 1985. Eastern Europe's production of electricity from nuclear power sources is planned to increase sharply, with plant capacity growing from the current level of 4.8 billion MW to at least 23 billion MW by the end of the decade.

Although energy production should pick up somewhat in Eastern Europe, the regimes' targets are unrealistic. Coal output more likely will grow by only 1 percent annually (in bdoe), at best, given the problems confronting the extractive industry and the current cutbacks in imports and investment. (See Figure 6.) The production of natural gas and oil will stagnate. Furthermore, the nuclear power program is likely to fall far short of plan objectives. Nuclear power plant capacity is more likely to reach about 14,000 MW, or only 40 percent of the planned figure.

### Figure 6
### Eastern Europe: Primary Production of Energy by Type of Fuel



[a] Includes hydro and nuclear power

[b] Projected

300035 7-83

### *B. Future Soviet Deliveries*

Eastern Europe still hopes to receive some additional energy from the Soviet Union over the next few years despite the cutbacks in oil deliveries in 1982. While the plans imply that Soviet oil and coal deliveries will remain constant, East European officials mention increasing imports of electricity and gas by at least 320,000 bdoe by 1990. Yet even if deliveries increased according to East European plans, total Soviet energy deliveries probably would account for less than 30 percent of the regime's primary energy consumption by 1990, only a marginal increase from the current share of 27 percent. Exactly how much more Soviet energy might be delivered and how soon—even for the small annual increments of just 2 percent per annum currently talked about—remains highly tentative, and dependent on the completion of several major energy projects. The Soviet Union is likely to fall short of meeting the deadlines currently mentioned and thus significant amounts of new Soviet energy will not be available to Eastern Europe in the near term. Moreover, Soviets might even make further oil cuts to help ease their own problems with domestic oil supply and hard currency shortages.

The Soviets' ability to increase deliveries of electricity hinges, for the most part, on two major powerplants currently under construction in the Soviet Union. Both have hit snags. Hungary, Poland, and Czechoslovakia are helping to construct the Khmelnitsky atomic power station and a corresponding transmission line. The U.S.S.R. planned to begin deliveries to them in 1984, and by 1990 the three countries hope to be receiving a total of 12 billion kilowatt hours annually.[13] Construction delays at Khmelnitsky, however, are likely to push back the startup date. Similarly, Bulgaria and Romania are helping to build an atomic power complex in the southern Ukraine in exchange for future deliveries of electricity, though no amounts have been mentioned. An agreement among the Soviet Union, Bulgaria, and Romania for a transmission line from the plant was reached only in August 1982, which means the plant is not likely to supply electricity to these two countries soon.[14]

Soviet deliveries of natural gas could play an increasingly important role for some of the countries of Eastern Europe. In part, future gas deliveries depend on the completion of new pipelines, including the new Siberia-to-Western European pipeline. Czechoslovakia's position appears solid with the Czechoslovak press recently announcing that the country would receive 2 bcm annually from the new pipeline.[15] The Poles have recently announced in the press that they will receive an additional 2 bcm of gas as payment for help on pipeline work within the Soviet Union.[16]

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[13] "Eastern Europe's Nuclear Future," East European Markets, 29 April 1983, Vol. 3, Issue No. 9, p. 1.

[14] "Energy Pact Signed With Romania, Bulgaria," Sofia BTA in English, 5 August 1982 as reported in FBIS Daily Reports, Soviet Union, 6 August 1982, p. F3.

[15] "New Compressor Development for Gas Pipeline, Prague, HOSPODARSKE NOVINY, 22 April 1983, as reported in East Europe Report, Economic and Industrial Affairs, 2 June 1983, p. 7.

[16] "Poland To Lay Soviet Gas Pipelines," Financial Times, 6 May 1983.

According to press reports, Bulgaria expects to receive up to 10 bcm annually in 1985—nearly double the current level of deliveries.[17] Some of this gas may be tied to the old Orenburg project. Bulgaria is just now receiving its full allotment for work done on this project, with the delay resulting from the failure to complete work on its internal pipeline network.

The Bulgarian situation highlights an important problem regarding Soviet gas—the capability of Eastern Europe to use additional gas imports.[18] Current official plans mention additional deliveries of nearly 15 bcm to Eastern Europe by 1990, either through the new pipeline or unused capacity in the Orenburg pipeline. The Soviets are likely to be in a position to supply much more. The OECD speaks of the possibility of Soviet gas deliveries to Eastern Europe climbing as high as 60 bcm or double the current level of imports.[19] But natural gas is not a good substitute for oil especially in the transportation sector. Moreover, the current slowdown in investment in the region will impede efforts to switch to gas. Sofia's ambitious plan, for example, depends not only on completing internal pipelines but also on doubling the number of plants that can use this fuel.[20] One Hungarian article points to the slow progress in converting Budapest to the use of natural gas; plans for making home heating dependent on natural gas by 1985 have been pushed back to 1990.[21]

### C. *Prospects for Hard Currency Imports*

Despite poor prospects for domestic energy sources and Soviet deliveries (especially of oil), Eastern Europe is unlikely to purchase large amounts of oil on world markets even at reduced prices. The outlook for the region's hard currency import capacity is bleak through most of the decade because of declining export growth, onerous debt service obligations for some countries, and poor borrowing prospects. Recession in the West has been only one factor contributing to the slowdown in the annual growth rate of East European exports to developed countries to less than 6 percent in the period from 1979 to 1982, versus nearly 15 percent between 1970 and 1978. Many East European goods do not meet Western standards, and the region is losing some sales due to increasing competition from the LDC's. Moreover, continuing deterioration in the terms of trade with the West has required the East Europeans to export a greater volume of goods merely to sustain a constant real level of imports.

Deteriorating terms of trade with the USSR also are expected to continue as the cost of Soviet raw materials outpaces the rise in prices for manufactured goods produced by the East Europeans.

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[17] "Soviet Gas Imports To Increase; Pipeline Progresses," Sofia BTA, 20 May 1980, as reported in FBIS Daily Report, Eastern Europe, 21 May 1980, p. C11.

[18] For a discussion of this problem see "The Potential for Substitution of National Gas for Oil in Eastern Europe," Wharton's Centrally Planned Economies Current Analysis, Vol. II, Number 97, 7 December 1982.

[19] World Energy Outlook, OECD (Paris, 1982), p. 192.

[20] "Use of Soviet Gas," Sofia, BTA, 15 February 1982, as reported in Summary of World Broadcasts, Part 2, Eastern Europe, 25 February 1982, p. A/10.

[21] "Slow Progress of Gas Conversion Programme in Budapest," Budapest Home Service, 6 April 1983, as reported in Summary of World Broadcasts, Part 2, Eastern Europe, 21 April 1983, p. A/13.

For example, the CEMA price for crude oil rose to over 90 percent of the world market prices in 1983 and was expected to surpass the world market price by 1984 if no adjustment was made to the current pricing formula. Thus, Eastern Europe could be forced to divert possible hard currency exports to the Soviet Union to maintain imports of Soviet goods and raw materials.

Throughout the rest of the decade, financing problems also will hurt chances for a boost in energy imports. Western bankers still remain cool about lending to the region, including to those countries—Bulgaria and Czechoslovakia—which have their international finances in relatively good order. Without a revival in lending, the prospects are even poorer for a boost in the region's hard-currency import capacity.

### *D. Renewed Conservation Efforts*

Given the bleak prospects for fuel supplies, the East European regimes are planning to put more emphasis on energy savings. The regimes hope to curtail energy requirements through a combination of—

Stabilization measures that will dampen demand;

Some restructuring of the economies toward the less energy intensive sectors; and

More stringent conservation measures designed to improve energy efficiency (i.e. reduced energy-output ratios).

In order to deal with mounting external financial constraints, most East European countries were forced to accept lower growth rates in the late 1970's and early 1980's—which, in turn, slowed growth in the demand for energy. Hungary has been implementing austerity measures since at least 1979, and Czechoslovak officials have acknowledged publicly that little or no growth is expected in the near term. While Romania and Bulgaria have lowered targets somewhat compared to past plans, publicly announced goals still remain somewhat ambitious. At the same time, East German officials publicly voice confidence in the economy's buoyancy despite extremely slow growth in 1982 and the possibility of difficult financial problems.

East European officials have discussed restructuring their economies to conserve energy, but they generally recognize that this is not a near-term solution. Constraints on imports and investment will preclude retooling many plants. Moreover, the worsening unemployment often accompanying structural change would be problematic, especially with officials already concerned over growing consumer frustration. Finally, any moves that would significantly alter production capabilities would have to be considered in the larger context of commitments to other CEMA countries and, therefore, could not necessarily be taken unilaterally.

Most of the regimes, therefore, are apt to rely even more heavily on conservation programs. We expect that frequent price boosts to both households and industry will continue in all countries except perhaps East Germany. Tighter controls over the allocation of energy, as in East Germany, also are planned. The regimes will probably also pursue conservation measures that have received little attention in the past, including:

Improved insulation, especially in apartments or along heat carrying pipelines;

Greater use of secondary energy sources, including the heat byproduct of electricity production;

Better monitoring of consumption through the installation of metering devices; and

Some upgrading of the capital stock, especially the replacement of inefficient boilers and furnaces.

These East European conservation efforts will have only a limited impact on fuel saving over the next few years. Success would require extensive substitution of new capital for energy, an effort is already seriously impeded by the slowdown of investment throughout the region. In 1981, new investment averaged little more than 6 percent of the total capital stock in the region, and about one-third to one-half of this was needed merely to cover depreciation or replacement of old capital assets. For the next few years, moreover, investment is expected to stagnate or fall.

Another major impediment to boosting energy efficiency is the increasing share of coal in the region's energy balance. Even Polish hard coal—the best quality coal in the region—suffers from declining heat content. It is falling by about 0.6 percent a year, according to official Polish data.[22] The regimes nevertheless continue to base their plans on boosting coal production.

Finally, only limited progress toward energy efficiency can be made without market-type economic reforms. Current price hikes will help somewhat, but energy remains underpriced in most of the region. For example, producer prices for natural gas in Romania—the country's largest source of primary energy—remain well below the world market price, despite recent sharp increases. Moreover, as one Hungarian academician notes, boosting energy prices without carefully considering their relationship to one another and to prices of the non-energy factors of production will introduce still further distortions in the economy.[23] Most important, a piecemeal approach to reforming these economies can have only limited success in combatting waste; energy will continue to be overused as long as production volume rather than efficiency remains the key indicator of success for plant managers.

## V. IMPACT ON ECONOMIC GROWTH

### *A. Recent Experience*

Eastern Europe enjoyed strong economic growth from the mid-1960s until the second half of the 1970s as a result of adequate energy and labor supplies, buoyant investment, and rapid growth of imports from the West. From 1966 to 1978, East European GNP grew about 4 percent per year, with annual average rates of growth of 3 percent for Czechoslovakia and the GDR at the lower end of the spectrum, compared with rates of growth in excess of 5 percent for both Poland and Romania. Energy supplies rose on average by 4 percent annually over this period, and healthy gains in labor productivity—3 percent per year from 1966 to 1978—resulted principally from acceleration inputs of capital and hard currency imports. The level of investment increased by over 8 percent per year and imports from the West (in current prices) by 20 percent per year.

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[22] "A Reappraisal of Polish Energy Balances," Wharton Centrally Planned Economies Current Analysis, 20 July 1982, p. 1.

[23] "Energy Management Program of Sixth Five-Year Plan Discussed," as reported in East Europe Report, Economic and Industrial Affairs, No. 2462, JPRS 84559, 19 Oct. 1982, p. 113.

By the late 1970s, energy shortages combined with other problems to slow the economic momentum of Eastern Europe. From 1979 to 1982, annual GNP growth for the region excluding Poland averaged only 1.3 percent. Only East Germany maintained respectable rates of GNP growth (about 2 percent); growth in Czechoslovakia and Hungary fell from over 3 percent in the 12 years before 1978 to virtual stagnation between 1979 and 1982.

### *B. Prospects*

Economic growth for the rest of the 1980's will remain extremely slow as a result of numerous constraints that continue to affect East European economies. The rapid capital accumulation that contributed substantially to healthy GNP growth in the late 1960's and 1970's will be far less robust in the 1980's. To deal with external financial problems, adjustment programs will curtail investment further, and will continue to squeeze trade surpluses from increasingly strapped domestic economies.

East European planners also have a pessimistic assessment of the growth stimulus that would result from the extensive employment of the "factors of production." Published plans indicate that labor, capital, energy, and even materials are expected to increase only slightly in the 1980's. Thus, whatever growth is realized must come from the intensive utilization of these inputs, that is, higher productivity. Since 1979, however, labor productivity growth has declined steadily except in the GDR where it continued essentially unabated until 1982.

In order to assess East European growth prospects through 1990 under several energy supply scenarios, an analytical model that quantifies the contributions of labor, capital, energy, and other measurable factors to GNP growth is employed.[24] Production functions, estimated from East European economic performance since the late 1960's measure the contribution of labor and capital to GNP growth. While the level of GNP is fairly predictable once labor and capital have been estimated, variations in annual GNP also depend on other factors, including energy supplies, technological change, living standards, systemic problems, and weather.

#### HOW ENERGY SUPPLIES AFFECT ECONOMIC GROWTH: THE METHODOLOGY

Energy shortages affect economic growth by diminishing the effective use of the means of production. In particular, energy shortfalls limit the operation of transportation equipment and machinery. In order to estimate the impact of energy shortfalls on economic growth prospects, we proceed through five steps.

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[24] See inset for a brief explanation of the analytical framework used to make these estimates. The quantitative framework used in this paper does not explicitly identify the sensitivity of GNP to trade. To the extent trade has influenced the trend in productivity, its impact is implicitly included in our projection of combined factor productivity trends.

### *1. Forecast Energy Required To Operate the Capital Stock*

Expected additions to the capital stock can be estimated by extrapolating historical rates of capital accumulation as a function of investment. Because annual capital retirements include only about 2 percent of the existing stock, levels of gross investment exceeding 2 percent of capital stock provide for net capital expansion. Thus, despite constant or even declining levels of investment, we expect capital stock to continue to expand, albeit at a much slower pace than experienced in the 1970's. For the region as a whole, we expect the capital stock to grow at nearly 4 percent per year through 1990.

Energy efficiency (energy per unit of capital) has improved at an average rate of 1 to 2 percent per year since the mid-1960's. Despite declining efficiency prospects because of investment slowdowns and diminishing import capacity, we optimistically project that the annual gain in efficiency will continue to average nearly 2 percent per year through 1990. These trends in energy efficiency—combined with projected capital stock—yield our estimate of the growth in energy demand (i.e., the energy required to operate the capital stock). Our estimate shows that energy requirements will continue to grow at an average rate of about 1 percent per year through 1990—a marked slowdown relative to annual rates near 4 percent in the 1970's.

### *2. Estimate Energy Supply Prospects*

We combine our projections of indigenous energy production capabilities with our estimates of likely net imports from within CEMA (principally the Soviets) and from the hard currency market to arrive at energy supply forecasts. We expect that energy supplies for the region will increase about 1.5 percent per year through 1990.

### *3. Calculate a Measure of Energy Shortage*

The difference between our projection of energy requirements and energy supplies allows us to determine the existence and size of energy shortages. Our estimates of energy balances for Eastern Europe through 1985 indicate that shortages will grow. In several countries expected energy supplies fall behind demand by as much as 10 percent by 1985.[25] For the remainder of the decade, however, growth continues to slow for other reasons, and energy shortages may be less constraining.

### *4. Assess the Effect of Energy Shortages on Capital Utilization*

We assume that the ratio of energy supply to demand reflects any sacrifice in capital utilization due to energy shortages. If, for example, only 90 percent of nominal energy demand can be met, 10 percent of potential capital services are lost. Effective capital stock is thus defined to be total capital multiplied by the energy supply-to-demand ratio. If capital were the sole productive asset, GNP growth would be directly proportional to the change in effective capital. However, since capital is only one factor of production, potential GNP is diminished by something less than the energy supply-to-demand ratio. Labor, the other principal factor of production, is less directly affected by energy availability.

### *5. Evaluate the Impact of Reduced Capital Services on Growth*

Using historical data, we estimate the shares of GNP growth attributable to capital and to labor, and we use these relationships to forecast GNP. The relevant measure of capital services in this calculation is the effective capital stock. Because only about a third of GNP is contributed by capital, a reduction in the energy supply-to-demand ratio by 3 percent, for example, would reduce potential GNP by about 1 percent.

The sharp decline in productivity since the late 1970s seems attributable to the combined influence of these factors and none are expected to provide a stimulus to growth over the next several years. Estimates in the scenarios below are based on productivity trends for the period 1978 to 1982, which may be too optimistic because productivity could decline further as a result of stagnant or declining imports, declining living standards, and an aging capital stock. In every country, productivity growth has been noticeably slower in one or more recent years than the projection. (See Table 1 for projections of the most important economic indicators used in our estimates.)

---

[25] Energy shortages are necessarily an *ex ante* phenomenon. By the end of 1985, for example, adjustments (such as lower GNP) will have been realized, and *ex post* supply and demand will, of course, be the same.

TABLE 1.—EASTERN EUROPE: KEY PROJECTIONS, 1983–1990

[Average annual growth rates]

| | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania |
|---|---|---|---|---|---|---|
| Employment | 0.3 | 0.6 | 0.4 | 0.2 | 0.7 | 1.2 |
| Investment | 0 | 0 | 0 | 0 | 0 | 0 |
| Capital stock | 5.4 | 3.3 | 3.1 | 3.1 | 1.8 | 4.9 |
| Energy efficiency of capital [1] | 3.3 | 2.2 | 2.0 | 1.8 | 1.4 | 3.3 |
| Energy required for full capital utilization | 2.1 | 1.1 | 1.1 | 1.3 | 0.3 | 1.5 |
| Industrial productivity [2] | −1.0 | −1.5 | 0 | −1.0 | −3.0 | −2.0 |

[1] Projected annual improvement in energy per unit of capital—equal to average annual trend from 1965 to 1982.

[2] Projected annual change in combined factor productivity in industry relative to the average annual performance from 1965 to 1982.

## *C. Medium-Term Growth Prospects—1983–85*

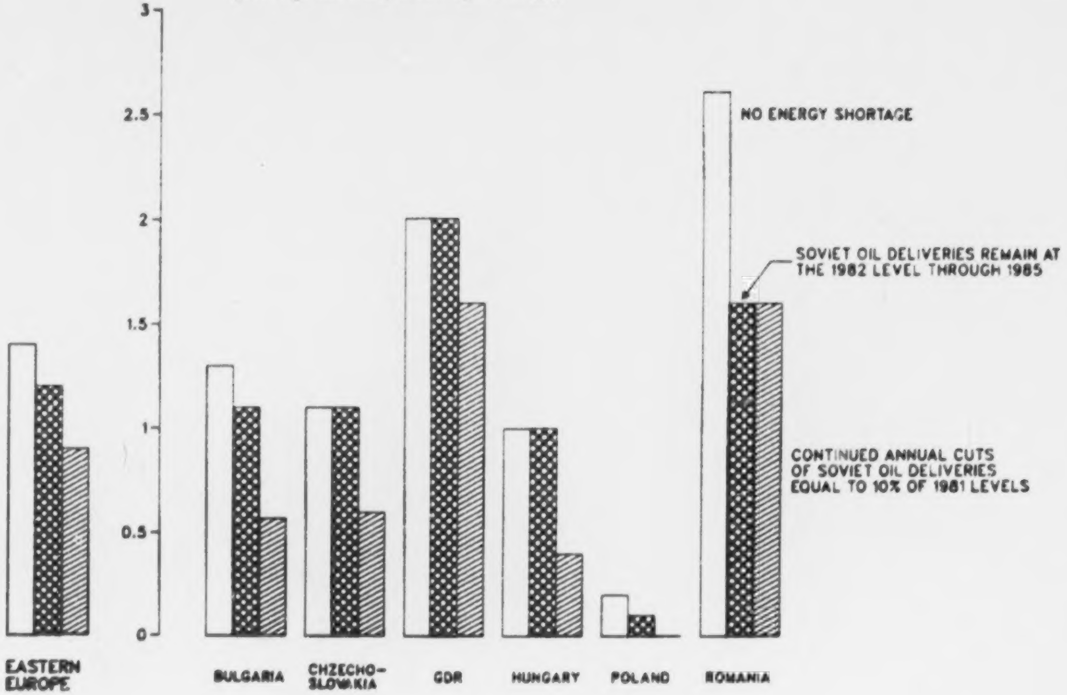
### 1. SCENARIO 1: NO ENERGY SHORTAGE

In this scenario, potential economic growth in the absence of a shortage of fuels is estimated in order to assess the fraction of the expected growth slowdown which is due to constraints other than energy. With energy supplies sufficient to operate the capital stock at capacity, growth in the region as a whole would average only 1.4 percent per year through 1985, a marked slowdown relative to performance from 1966 to 1978 but a slight improvement over recent experience. (See Figure 7.) Adequate energy supplies thus would enable regional growth to recover moderately from the virtual stagnation since 1978. The growth potential of Czechoslovakia, Hungary, and Romania in particular would be better in this scenario compared with the last 4 years. To sustain even this modest rate of growth of regional GNP, however, would require substantial additional energy imports by 1985. Such costly imports would be very unlikely for the next several years in light of continued balance of payments problems and the desperate need for non-energy imports.

FIGURE 7

GNP GROWTH IN EASTERN EUROPE, 1983–85

(average annual percentage change)



### 2. SCENARIO 2: SOVIET DELIVERIES AT 1982 LEVEL THROUGH 1985

A far more likely scenario is based on no increase in energy purchases on the world market and assumes that concessionary Soviet deliveries of oil remain at the 1982 level through 1985. An expected moderate increase in domestic production would allow energy supplies to grow, but by only 1 percent per annum through 1985. Projections of capital growth and annual efficiency gains at the rates achieved since 1966 indicate annual energy demand increases of about 1.5 percent through 1985 for the region as a whole. The disparity between nominal energy requirements and available fuels would depress regional economic growth through at least mid-decade. As a result of energy shortfalls, GNP growth would average less than 1.2 percent annually through 1985, down only marginally compared to growth with no energy constraints.

The following summarizes differences in the outlook for individual countries in the region:

> East Germany's ability to improve energy efficiency, if sustained, would prevent energy shortages despite only modest growth of supplies. GNP is likely to grow by about 2 percent per annum, the same rate as in the unconstrained case but still one-third lower than the rate recorded between 1966 and 1978.
>
> Czechoslovakia would find growth slowing sharply as compared to the 1970's but not primarily as a result of serious energy shortages. Non energy factors—primarily obsolescent capital stock—are expected to keep the average annual growth rate of GNP at about 1.3 percent through 1985 in both scenarios, or less than one-half the growth rate achieved in the 1966–1978 period.
>
> Bulgaria's relatively small economy—combined with its capacity to modestly expand domestic energy supplies and maintain significant energy imports from the Soviet Union—should allow it to meet most of its energy needs. The annual growth of GNP through 1985 thus falls just marginally from the unconstrained case to an average of about 1.1 percent. The marked slowdown in growth from the more than 4 percent annual average rate during 1966–1978 is due largely to continuing productivity problems.
>
> Hungary's energy supplies are expected to fall short of demand for the next several years as a result of domestic production problems and the regime's external adjustment measures. GNP growth would be about one percent per annum.
>
> From 1983 to 1985 Romania's energy inefficient economy would grow by less than 2 percent annually, compared to the nearly 3 percent rate feasible in the unconstrained scenario. In both scenarios the GNP growth rate would be cut by more than half compared with performance during the 1966–1978 period.
>
> In Poland, other problems overwhelm any prospective energy shortages and we project virtual stagnation over the next few years in both scenarios.

### 3. SCENARIO 3: CONTINUED CUTS IN SOVIET DELIVERIES

In Scenario 3, the impact of a significant decline in the region's energy supplies is assessed as a result of further annual cuts in concessionary Soviet oil deliveries equal to 10 percent of 1981 levels, as were imposed on Czechoslovakia, Hungary, the GDR, and possibly Bulgaria in 1982.[26] This scenario assumes that Eastern Europe does not compensate for these lower deliveries by increasing purchases from OPEC producers. Such cutbacks would further crimp growth everywhere but in Romania, which traditionally has not received cut-rate Soviet oil. Regional growth would fall considerably short of 1 percent, with some countries confronting stagnation or actual declines in GNP.

Bulgaria, Czechoslovakia, and Hungary—traditionally large recipients of Soviet oil—would find growth dropping sharply in the face of sustained cuts in Soviet oil. GNP growth would virtually stagnate in Bulgaria and Hungary and drop to just 0.5 percent in Czechoslovakia.

Further cuts in Soviet oil would also hit East Germany with GNP growth slowing from 2.0 percent to about 1.6 percent per annum through 1985.

Poland is almost entirely dependent on the USSR for its oil supplies and could ill afford to be included in the next round of reductions. The loss of 10 percent of its Soviet oil imports would assure even steeper declines in GNP as noted in the second scenario.

## *D. Growth Prospects for the Remainder of the Decade, 1986–90*

Problems other than energy make East European economic growth prospects in the latter half of the decade so poor that energy supplies may not pose an additional constraint.[27] Under the best of assumptions about energy supplies, economic prospects would be dimmed by a host of other factors, including:

The sluggish growth of the industrial labor force due to demographic trends and depletion of the once-large pools of agricultural labor;

Stagnant or declining labor productivity because of slow growth investment, falling living standards, and continued systematic rigidities which thwart incentives; and

Hard currency shortages that are likely to persist due to heavy debt service obligations, Western reluctance to boost lending to the region, and the continuing failure of many East European goods to meet the standards of Western markets.

---

[26] This scenario was examined to assess the vulnerability of the East European economies to further cuts in Soviet oil. The macroeconomic nature of the models we employ assumes that coal, oil, gas, and electricity are easily substitutable energy sources. Yet these interfuel substitutions are plausible only for marginal shifts; continued oil cutbacks of 10 percent per year would undoubtedly cause macroeconomic bottlenecks which are not treated explicitly in this model.

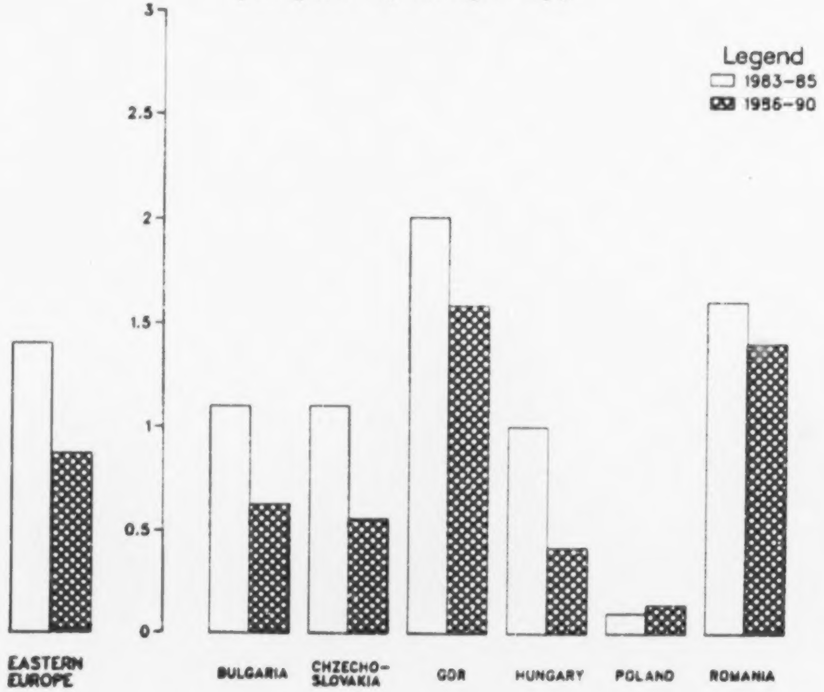
[27] If oil production fails to meet total Soviet requirements for domestic consumption, hard currency export earnings, and CEMA deliveries, Moscow might substantially reduce concessionary deliveries to Eastern Europe. The ensuing bottlenecks could markedly erode regional growth potential probably turning negative growth in most of the East European countries. The most important effects would be microeconomic, which are not accounted in the aggregate-type model employed here.

Using the model with the same economic indicators shown in Table 1, the rate of growth of energy demand is projected to slow to less than 1 percent per year in the latter half of the eighties. The rate of growth in energy supplies is projected to grow at about 1.5 percent annually and would satisfy these minimal requirements. This average annual rate of growth assumes growth in domestic production of energy of around 1.4 percent per year and an annual increase in net imports—largely Soviet gas and electricity as oil deliveries are held constant—of a little over 2 percent. Figure 8 shows economic growth prospects in the latter half of the decade compared to the estimates in the most likely scenario (Scenario 2) for 1983-85. GNP for the region as a whole is projected to average less than 1 percent a year.

FIGURE 8

EASTERN EUROPE: PROJECTED ECONOMIC GROWTH RATES

(average annual percentage change)



Growth in Bulgaria, Czechoslovakia, and Hungary is expected to fall to around .5 percent a year, half the rate of growth projected in the most likely scenario for 1983–85. This decline is due mostly to diminishing productivity in these three countries.

In Romania, relatively healthy stock growth in the supply of labor and in capital stock sustains GNP growth over 1 percent per year despite adverse productivity and efficiency trends.

Near stagnation is projected to continue in Poland, though uncertainty is so great that economic prospects by 1990 could be significantly altered by a variety of factors.

East German growth prospects in the longer term of over 1.5 percent per year are substantially better than the remainder of the region based on the possibly questionable assumption that East German productivity doesn't decline despite economic adversity.

Confidence in these projections diminishes rapidly as the forecast horizon is extended. The situation could become even worse, for example, should the Soviet Union impose still further cuts in their deliveries of oil. On the other hand, brighter growth prospects are possible if extensive reform programs or radical improvements in the external situation improve productivity prospects over the latter half of the eighties.

# ENERGY POLICY AND CONSERVATION IN EASTERN EUROPE

By Leslie Dienes* and Victor Merkin**

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## SUMMARY

The new period of economic austerity has seriously affected the priorities and thrust of energy policies of East European states. Throughout the region, the contours of such policies include a mix of supply-oriented, conservation and demand change *cum* substitution measures. However, there are wide differences in the coherence and feasibility of energy plans, their relationship to overall economic policy and their probability of realization. The authors find reasonable consistency and rationality in East German and Hungarian energy policies. Both strongly stress conservation and have achieved considerable success in moderating the energy intensity of their economies, even though they approach the task through a sharply different mix of administrative and economic measures. In addition, the former country continues to strive for a very high degree of energy independence and the complex transformation of its low quality lignites; the latter views energy policy as an intergral part of a trade-oriented open economy.

Czechoslvakia, while promulgating detailed energy-conservation programs, has not developed the logistics and the institutional and technical arrangements to successfully implement them. Polish and Romanian energy policies seem to be in total disarray. In Poland, neither the Parliamentary Commission for Energy and Mining nor

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the Council of Ministers count among their members any specialist in the mining and energy field. (The Minister of Energy and Mining is no exception.) In the middle echelons, the technical literature reflects profound disagreement and pessimism but a uniform dissatisfaction with the past and present failures of the political leadership to act upon the advice of the energy community.

In all these states, the requirements of the energy sector have led or currently are leading to serious macroeconomic distortions in investment allocation. Combined with the current investment crunch, these requirements—in the opinion of East European experts themselves—are endangering technological advance and rejuvenation throughout the economies of these states. Sharply reduced capital availability will also curtail prospects for long-term energy conservation and improvements in energy efficiency. CMEA studies show tremendous potential for energy saving through the replacement of obsolete capital stock and investment in heat recovery and energy monitoring equipment. Except in a few restricted fields, however, the cost of such savings is also shown to be very high (often approaching world energy prices per calorie) and to demand long lead-times.

Energy waste in Eastern Europe stems both from the structural pattern of energy flows and from systemic inefficiencies, the limited ability of these economies to respond to changing relative scarcities. The large but greatly varying share of energy used up and lost before delivery to other branches is crucially influenced by the type of raw fuels available and the necessity to upgrade and convert them. The very large losses in final consuming equipment are determined both by the type, quality and age of that equipment and by the lack of sufficient incentives to conserve. The authors show that in East Europe today both the price mechanism and administrative measures (including rationing) are being utilized in various combinations to conserve energy. Yet household and, even more, wholesale energy prices are still far from allowing self-financing and promoting rational energy management. As to administrative measures, the vertical structure of management (which, with the exception of Hungary, continues to prevail through the region) permits strong ministries to ignore or subvert in their annual plans even officially promulgated target programs on conservation.

## I. INTRODUCTION

Energy policy everywhere is woven into the fabric of the larger economic and social environment. In East Europe, the current economic austerity has seriously affected the priorities and thrust of energy polices of these states. The attempts of the 1970's to shield the region from dramatic changes on the world market, an endeavor aided by access to Western credits and by expanding Soviet energy supplies at concessionary prices, have failed. These props broken, all these countries have been forced to adopt a balance of payment oriented economic strategy, to which most other goals have had to be subordinated. Throughout the region, energy planning is tailored to these macroeconomic constraints. In each state, the contours of energy policy today include a mix of measures from conservation and demand management to fuel switching and import substitution. The strong stress on conservation and demand management is a departure from the earlier focus on supplies. Yet the latter continues to be critical, not the least because fuel-energy substitution (coal, gas and nuclear energy for petroleum) hinges on expansion of domestic resources at costs sustainable by the national economy.

Centrally managed economies possess a structural bias toward supply-oriented adjustments and solutions. In the words of a Polish specialist, it is always easier to control a relatively small number of units charged with the limited task of energy supply (mining, power generation and procurement of fuel from abroad) than the far more numerous entities, with an immense complexity of linkages and motivation, which consume that energy. For the latter, energy saving is but one of many goals and often not a very major one. Therefore, conservation in command economies does not follow directly from the prevalent economic mechanism, but is imposed on them by grave resource, balance of payment and political constraints.[1]

Poland may be the best example of the ruinous impact of such a supply-oriented bias, though Romania could serve almost as well. In the 1970's, the Polish leadership made coal the mainstay of the nation's energy base and its most important export commodity. Supplies were believed to be forthcoming with hardly a problem and exuberant projections placed output at 250 and even 300 million tons by the turn of the century.[2] Polish energy specialists, perhaps the most numerous, well-organized and vocal energy community in East Europe, had sounded the warning about the upcoming energy crunch early enough, formulating several energy-saving programs. However, the excessive production slant of the authorities, combined with low energy prices and the overblown optimism about supplies, nipped these conservation programs in the bud. They were judged to be too costly, the recommendations ignored and the limited funds allocated for them were cut or shifted to energy procurement projects. Even "The Energy Crisis Memorandum—1982" tucks energy conservation away into Chapter 13 of its sixteen chapters.[3]

Given this systemic supply-oriented bias and the importance of domestic resources for economizing on the scarcest fuel, petroleum (imported for the most part and critical for the balance of payment), a brief assessment of coal and nuclear power in East Europe, according to the latest evidence, is in order. By nearly unanimous agreement among energy specialists, these two sources must furnish essentially all domestic increment in energy for the remainder of this century.

## II. COAL AND NUCLEAR ENERGY SUPPLIES

Coal reserves in Eastern Europe are comparable in magnitude to those of Western Europe, roughly evenly divided between hard coal and lignites (including brown coal). In physical tonnage Poland dominates the former category, the GDR, less overwhelmingly, the latter. As in West Europe or the European USSR, however, underground mining must cope with difficult and worsening geological conditions. In Polish Silesia, some mines reach below 1,000 meters and in the new Lublin Basin extraction is beginning below 800 meters. Mine exhaustion is a serious problem. Of the 65 collieries today, 11 will cease production by the end of the century, another 11 a decade later.[4] Capital constraints to replace old mines and increase production are claimed to inject a severe uncertainty into output forecasts, since almost one half of the about 116 billion zlotys of investment needed even for a "pessimistic" scenario would have to be realized *before* 1990.[5]

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[1] Zycie gospodarcze, 1983, No. 19 (May 8), p. 13.
[2] K. Kopecki, Jutro energetyczne Polski, Warsaw, 1981, p. 99.
[3] Nauka Polska. 1982, No. 4 p. 59.

Even in open pit mining, access to new seams is becoming ever more arduous and costly, the ratio of overburden to coal is growing sharply and the quality of the fuel has been declining. Both East Germany and Czechoslovakia have moved rivers, rail lines and towns to reach new seams (29 towns and hamlets to be relocated or destroyed by 1980 in the North Bohemian Basin alone). Yet, according to the Czechoslovak fuel and energy minister, possibilities for production increases in his country are very limited and the last of coal-fired power stations are now going on stream.[6] The 278 million tons of raw coal produced by the GDR in 1982 required the movement and disposal of well over a billion tons of overburden, about 1 to 4 ratio today. In the new pits under preparation, the ratio will reach 1 to 7.[7] In Poland, the two new, much heralded coal and lignite fields (Lublin and Belchatow) are beset with severe hydrological and geological problems and produced a total of only 5 million tons in 1983, equivalent to barely over 1 million tons of hard coal. Over the next decade, they can provide only very meager additional supplies.[8] The extent of health and environmental burden is among the worst in the world. In the GDR, yearly emission of $SO_2$ per $km^2$ 2.6 times exceeds that in the Federal Republic (37 tons vs 14.5 tons), and per inhabitant is four times greater (236 kg vs 58 kg). Across the border in North Bohemia, a new coal pit is tapping seams with 10 percent sulfur.[9]

From deposits similar to those of Western Europe, the six small states considered here manage to produce twice as much coal in physical tonnage (though only some 50 percent more in heat content) than the European Community. This comparison should temper expectations for much larger total production by these small states in this decade, even century. Throughout the 1970's, East Europe's output rose by only 1.4 percent per annum. Four-fifths of the increment in tonnage and all growth in heat content was achieved in Poland,[10] though 20 percent of that increase may have been fictitious.[11] Polish specialists, however, doubt that much, if any further growth in Poland is possible for the next 15 years.[12] All this leaves nuclear power as the only remaining option for increasing domestic energy production substantially in the forthcoming years. Yet, the domestic character of that resource has to be qualified, for, though both Czechoslovakia and Hungary produce uranium yellow cake, enrichment for all states takes place in the USSR. According to Czechoslovak data, fuel costs today comprise 20-30 percent of the total cost of nuclear electricity, but one expert claims the Soviet Union will treble the price of fuel rods by 1985 and will likely raise it further later on.[13] The USSR will, therefore, maintain not only strategic control over that energy source but will exercise a growing financial leverage as well.

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[4] Czeslaw Mejro, Wybrane zagadnienia polskiej energetyki, Wroclaw, 1982, p., 23 and Przeglad techniczny—innowacje, No. 20, 1983, p. 9. The average depth of Polish coal mines today is over 500 meters, an increase of almost 140 meters in two decades, with an 870 meter average depth forecast by 2000.

[5] Przeglad techniczny—innowacje, No. 20, 1983, p. 9.

[6] Energy Policy, June 1976, p. 126 and Radio Free Europe (henceforth RFE), "Czechoslovak Situation Report," March 2, 1978, pp. 2-4 and Energia es atomtechnika, No. 1, 1983, p. 9.

[7] Cynthia Schultz, "RFE Background Report," No. 48, March 11, 1983.

[8] Przeglad techniczny—innowacje No. 15, 1982, p. 27; No. 29, 1983, p. 8; Polityka, No. 43, 1982.

[9] Deutsches Institut für Wirtschaftsforschung (henceforth DIW), Wochenbericht, No. 4, 1983, pp. 43-49 and RFE, "Czechoslovak Situation Report," March 2, 1978, p. 2.

Installed nuclear capacity through East Europe totaled 4.5 million KW in 1982 which, at an assumed 65 percent availability, contributed 5½ percent to the region's power output. Presently four states (GDR, Czechoslovakia, Bulgaria, and Hungary) have operating reactors, in the other two the nuclear program is still in the preparation or very early construction stage. Bulgaria, the GDR and Czechoslovakia are the most "nuclearized", with atomic plants contributing almost a quarter of all Bulgaria's power generation in mid-1983. In the current (1981-85) Five Year Plan, Czechoslovakia expects to obtain more than nine-tenths of all energy increment from nuclear sources.[14] Romanian plans for 16 CANDU reactors from Canada have been dashed. At best, only one such plant will be built now and that country, too, has turned to the USSR.[15] For East Europe as a whole, plans call for an aggregate capacity of 12 million KW by 1990, a capacity originally intended for 1985. However, it now appears that even this reduced target will remain beyond the resources of these small states, though it may perhaps be approached with the partial inclusion of the Ukrainian Khmelnitsky station, half of whose output is destined for East Europe.

The ambitious nuclear program represents for East Europe an enormous economic burden and technological hurdle for which the region is badly prepared. For Czechoslovakia, the state most involved, it may lead to macroeconomic distortions on a scale exceeding even that which had been forced on that country during the 1950s. According to a Czech expert, direct investment outlays alone on 5 plants, with an aggregate capacity of 9.1 million KW, are projected to total well over 100,000 million crowns in today's prices. Therefore, even without cost escalations, an equivalent of more than two years of Czechoslovakia's total industrial outlays would have to be devoted to the nuclear program during the 1980's.[16]

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[10] Computed mainly from Statisticheskii ezhegodnik stran-chlenov SEV, (henceforth, SE, SEV), 1982. Moscow, 1982 pp. 71 and 109. For GDR heat content taken from UN., ECE, Annual Bulletin of General Energy Statistics for Europe, New York, 1981, p. 52.

[11] Zycie gospodarcze, No. 48, p. 8.

[12] Przeglad techniczny—innowacje, No. 20, 1983, p. 9.

[13] Quoted in RFE, "Czechoslovak Situation Report," No. 15, September 3, 1982, pp. 5–6.

[14] See Alex Wynnyczuk's contribution in present volume; "Heti Vilaggazdaság," September 3, 1983, p. 14 and "Energetika," No. 6, 1982, p. 247.

[15] Heti Világgazdaság, September 18, 1982, p. 8.

[16] Jan Tuma, quoted in RFE, "Czechoslovak Situation Report," No. 15, September 3, 1982, p. 6. Combined industrial investment in 1979 and 1980 amounted to 116.7 billion crowns, only 10

Continued

Elsewhere the relative investment burden and claim on other resources may not be very much less. In Hungary for example, expansion of the Paks atomic station and power import from Khmelnitsky (i.e. nuclear sources) will represent the entire increment of electricity until 1990 and plans for the construction of all other power plants have been scrapped.[17]

The program also entails great risks, since it is predicated on precise and close cooperation among CMEA states about an advanced technology which each of them has barely begun to learn. The difficulties of multilateral integration and trade in East Europe have proved to be severe even in more mundane fields. As for cooperation in the field of nuclear power, the June 1982 session of the CMEA specifically pointed to serious delays, production and safety problems requiring immediate attention.[18]

Finally, it is well to put the savings of fossil fuels effected by atomic reactors into perspective If all of the projected 12 million KW capacity is actually on line by 1990, the fuels displaced should approximate about 30 millions ton of standard fuel or some 5 percent of East European aggregate energy demand in 1980.[19] As a percentage of 1990 demand, that share should be less, only 4 percent, assuming total consumption increases by no more than 1 percent per annum. Most of this saving would be coal with minor amounts represented by natural gas. In that time frame the actual impact of nuclear energy on petroleum demand should be almost negligible. East Germany and Poland burn virtually no oil for the generation of electricity and Czechoslovakia hardly any. The three southern countries combined use between 6 and 7 million tons, i.e. 6 percent of East European gross petroleum consumption in 1980.[20] All are making strenuous efforts to reduce such allocations still further, even when this means switching much oil fired base load capacity over to intermediate load and satisfying the base demand by obsolete, inefficient coal-fired units.[21]

## III. ENERGY LOSSES—CONSERVATION STRATEGIES

Energy waste in Eastern Europe stems from both the structural pattern of energy flows, with the nature of the fuel-mix playing a dominant role, and systemic inefficiencies, the limited ability of these economies to respond to changing relative scarcities. Energy losses occur basically in two widely separate stages: (1) within the energy sector, before delivery to the consumer and (2) in consuming

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billion less than Tuma's figure for the five nuclear plants. Ibid. and SE, SEV, 1981, p. 145. Associated investment is certain to reach more than 10 billion crowns and cost escalations for the whole program are a foregone conclusion.

[17] Energia és Atomtechnika, No. 12, 1981, p. 522.

[18] RFE, "Czechoslovak Situation Report," September 3, 1982, p. 14.

[19] Assuming a 70 percent average capacity factor for the nuclear plants and a thermal power station efficiency a little below 35 percent. With higher efficiency at thermal plants, replacement would be less.

[20] At the end of the 1970's, Romania burned rougly 4 million tons of petroleum products in power stations; Hungary, less than 1.5 million; and Bulgaria, less than 1 million. Estimated from the fuel balance of power stations and the utilization of refinery mix in these countries as given in Energetica, 1981, No. 10, pp. 420 and 422; G. Márton, A hazai energiaszerkezetváltozás fontosabb regionális kérdesei, Budapest, 1974; László Kápolyi, Ásványinyersanyag és energiapolitikánk alapjai, Budapest, 1981, p. 142; P. S. Neporozhnii, ed., Elektroenergetika evropeiskikh stran-chlenov SEV, Moscow, 1981, p. 17 and Boris Popov, Bulgaria's Power Generation, Sofia, 1979, p. 8.

[21] Energiagazdálkodás, No. 9, 1981, p. 410.

equipment and apparatus, be it in factories, farms or households. The fuel mix has a major impact on losses in both these stages, since coal, lignites and other solids are thermodynamically less efficient sources of energy than oil and gas. Systemic inefficiencies appear more concentrated in the second stage, since central control and monitoring of a few large producing and transforming enterprises is clearly more effective than of the much greater number of consuming units with a wide range of types, age and quality of equipment.

The excessively coal-dominated fuel mix of the northern states of East Europe, unique in the world aside from China and South Africa, is attended by the thermodynamic penalty of high energy loss and severe environmental degradation. The GDR's case is the most remarkable, given the very poor quality of its only fuel, lignite. No other country meets over three-fifths of its energy needs from such a poor fuel or derives from it close to 80 percent of its electricity. To be used by a modern economy, this wretched fuel must be extensively up-graded (i.e. by briquetting and carbonization) and converted into electricity, gas and liquids, processes accompanied by very high energy losses.[22] Altogether, only some half of all aggregate energy available in the GDR, and less of that derived from lignites alone, is actually delivered to consumers outside the energy sector. By comparison, even in Poland, where the contribution of coal to aggregate energy is somewhat greater still but the coal is of much higher quality, about 13 percent more of primary energy was so delivered in the late 1970's.[23] Yet, as long as lignite remains almost the "single crop" of the East German energy economy, putting up with such abnormally high processing and conversion losses may be regarded as rational.

East Germany's determination to use its poor coal to the hilt and to maintain a high degree of self-sufficiency in energy products is also shown by its efforts to liquefy and gasify its lignites on a considerable scale and to base a large part of its organic chemical industry on that fuel. Wolfgang Mitzinger, GDR Minister of Coal and Energy, revealed recently that 5 percent of all liquid fuels and one-fourth of all organic chemicals in that country are derived from lignite. Similarly, 42 percent of pipeline gas in 1976 was also derived from the same source. Such processing of lignites is claimed to obviate the importation of an extra 7 million tons of oil today and, with the expansion underway and planned, that of 8 million tons in 1985 and 11 million in 1990.[24]

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[22] DIW, Wochenbericht, No. 5, 1981, p. 61 and No. 4, 1983, p. 45 and Koks, smola, gaz, Nos. 2-3, 1979, p. 41.

[23] L. Dienes and Nikos Economou, "CMEA Energy Demand in the 1980's: A Sectoral Analysis," in NATO, Economics Directorate, CMEA: Energy, 1980–1990, Newtonville, Mass., 1981, pp. 44–46 and Appendix.

Raimund Dietz, Vienna Institute for Comparative Economic Studies, Energy Data Bank (based on official data supplied to the ECE) gives only a 38 percent loss without non-energy uses and 43 percent with non-energy uses so included. However, in these tables an unexplained "Other Consumers" category is added to the Industry, Transport, Household-Commercial and Agricultural sector and in the GDR this unexplained category accounts for an unusually high 21.8 percent of total final consumption or delivered energy. Clearly, much of that rubric represents losses in thermoelectric and chemical conversion of brown coal in enterprises technically not belonging to the energy sector (e.g., some chemical enterprises). Therefore, these data are broadly in line with the above mentioned estimates.

Die Wirtschaft, No. 7, 1979, p. 24 puts self consumption and conversion losses at lignite-fired power stations alone at 35 percent of aggregate energy consumption in the whole economy of the GDR. Energy used and lost in mining. oil refining and town gas production should easily account for the remaining 15 percent.

Where hydrocarbons dominate the fuel-mix, higher thermodynamic efficiency is easier to achieve. During the 1970's, for example, when Hungary was raising the contribution of oil and gas in the energy mix, the portion of aggregate energy delivered to consumers outside the energy industries increased sharply, reaching over 80 percent by the end of the decade.[25] Unfortunately, this tremendous improvement was purchased at a price of an equally sharp rise in import dependence at a time when energy costs were about to increase. The contribution of imports to total energy demand in Hungary grew from less than a third in the mid-1960's and 37 percent even in 1970 to 52 percent by 1980.[26]

Looking back recently on the country's energy program and the stress on hydrocarbons during the 1970's, two respected economists could still support its basic outlines.[27] Yet, especially from the hindsight of the second oil shock, the penetration of oil and gas into markets where these quality fuels vis-à-vis coal produce the smallest relative economic gains was clearly overdone, just as it was overdone in Romania and most countries of Western Europe. By 1980, more than half of all electricity produced in Hungary and two-thirds of all thermal electricity produced in Romania was generated from hyrdrocarbons.[28] In the present decade both of these states with strongly oil and gas-based energy economies are making strenuous efforts to reduce petroleum allocations to power stations sharply. In the short run, this is accomplished partly by switching much oil-fired base load-capacity over to intermediate load and satisfying that base demand by obsolete, inefficient coal-fired units.[29] This cannot but erase some of the reduction in conversion losses achieved in the past decade, an increased energy waste which must be made good elsewhere in the system. In the long run, savings of oil are to be attained by construction of modern coal-fueled base-loaded stations, a program in which both countries, but especially Romania, are lagging considerably.

The wastage of delivered energy in the many thousands of consuming units is much harder to estimate, combat and control. These consuming units embrace the final consumer and municipal services as well as production enterprises of factories and farms. As in most centrally planned economies, the first two are still relatively modest consumers and the lion's share of energy deliveries goes to enterprises, especially in industry. For East Europe as a whole, the share of industry in delivered energy actually increased between 1973 and 1980, a trend contrary to that in North America or West Europe, and reached some 54 percent at the latter date. In

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[24] Neue Bergbautechnik, No. 10, 1981, pp. 546–50 and Sitzungsberichte der Akademie der Wissenschaften der DDR. Series: Mathematik/Naturwissenschaften/Technik, Issue 26N, 1980, p. 8.

[25] R. Dietz, op. cit., and L. Dienes and Nikos Economou, op. cit., pp. 44–46. Fuels used as chemical raw matrerials included.

[26] Energiagazdálkodás, No. 6, 1982, p. 268.

[27] Mme. F. Nyitrai, "Energiafelhasználás és struktura . . . ," Gazdaság, No. 1, 1980, pp. 42–43 and M. Hegedüs, "Az energiaszükséglet várható alakulását befolyásoló tényezök," Gazdaság, No. 2, 1982, pp. 102 and 104.

[28] Neporozhnii, ed., op. cit., pp. 34 and 101.

[29] Energiagazdálkodás, No. 9, 1981, p. 410.

Romania, industry used some two-thirds of final energy.[30] Given the priorities of the leadership and the influence of strong ministries, energy allocation to industry, but increasingly also to agriculture, cannot be arbitrarily curtailed. Conservation can be a goal only in its economic meaning, via improvement in efficiency per unit value of output, with the impact on production and growth carefully considered. Energy use in households, in personal travel and in some services, on the other hand, has little or no direct connection with economic output, particularly of the type Soviet and East European planners have been stressing. Allocations here can be curtailed without an immediate impact on the muscles of the economy, subject, however, to these regimes' concern with social welfare and their fear of social unrest.

In East Europe today, both the price mechanism and administrative measures (including rationing) are being utilized in various combinations to save energy (Tables 1–2). This applies to the final consumer as well as to enterprises. Yet household and, even more, wholesale energy prices generally are still far from marginal costs, are too low to permit self-financing by the energy sector and to promote rational energy management. Only the price of gasoline has reached or surpassed West European levels, but taking a far larger bite out of the household budget than in most Western states. The household economy is also penalized by its limited access to clean, high quality and efficient fuels.

TABLE 1.—ENERGY PRICES IN POLAND (ZLOTYS PER TON OF HARD COAL EQUIVALENT, I.E. 7 MILLION KILOCALORIES)

| Fuels | 1970 | 1980 | 1982 | 1983 |
|---|---|---|---|---|
| Lignite: (a) | 280 | 349 | ND | 1,500 |
| Hard coal | | | | |
| (a) | 398 | 582 | 2,424 | 2,788 |
| (b) | 647 | 705 | 2,204 | ND |
| Coke: | | | | |
| (a) | 943 | 1,320 | [1] ca 4,000 | [1] ca 4,400 |
| (b) | 792 | 792 | 2,386 | ND |
| Natural gas: | | | | |
| (a) | 563 | 1,326 | 5,833 | 7,000 |
| (b) | 750 | 750 | 2,250 | ND |
| Coke oven gas: | | | | |
| (a) | 304 | 476 | ND | ND |
| (b) | 540 | 540 | 2,333 | ND |
| Residual fuel oil: | | | | |
| (a) | 400 | 1,267 | ND | 6,000 |
| (b) | 867 | 2,667 | ND | ND |
| Gasoline (74 octane): | | | | |
| (a) | 4,110 | 7,535 | 26,929 | 26,929 |
| (b) | 4,893 | 18,593 | 29,286 | 29,286 |
| Diesel fuel: | | | | |
| (a) | 1,714 | 4,971 | 19,286 | 19,286 |
| (b) | 2,014 | 12,000 | 21,429 | 21,429 |
| Electricity: | | | | |
| (a) | 4,309 | 4,960 | [1] ca 9,930 | [1] ca 10,920 |
| (b) | 7,317 | 7,317 | 14,646 | ND |

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[30] R. Dietz, op cit. and U.N., ECE, Economic and Social Council, The Impact of Energy on Future Economic Growth, December 1982, p. 8.

## TABLE 1.—ENERGY PRICES IN POLAND (ZLOTYS PER TON OF HARD COAL EQUIVALENT, I.E. 7 MILLION KILOCALORIES)—Continued

| Fuels | 1970 | 1980 | 1982 | 1983 |
|---|---|---|---|---|
| Piped steam and hot water: | | | | |
| (a) | 700 | 1,540 | ND | ND |
| (b) | 1,540 | 1,540 | ND | ND |

[1] For 1982 roughly same percentage rise is assumed as for households. The 1983 price rise was 10 percent.

Note.—(a) = wholesale, (b) = household.

Sources: 1970 and 1980 from A. Szpilewicz and J. Macieja, "Poland's Energy Policy." Vienna Institute for Comparative Economic Studies, No. 81, 1982, pp. 37–39. The rest of the data are culled from a variety of Polish newspapers and periodicals.

## TABLE 2.—WHOLESALE FUEL PRICES IN CZECHOSLOVAKIA (CZECHOSLOVAK CROWNS PER TON OF HARD COAL EQUIVALENT)

| Fuels | 1971 | 1979 | 1981 | 1985 forecast |
|---|---|---|---|---|
| Brown coal | 242 | 295 | 350 | 375 |
| Coal dust | 245 | 300 | ND | ND |
| Natural gas for boilers | 465 | 728 | 1,100 | 1,150 |
| Natural gas for chemical uses | 404 | [1] 544 | ND | ND |
| Town gas | 712 | [1] 815 | ND | ND |
| Residual fuel oil | 284 | 752 | 1,050 | 1,100 |

[1] For 1977.

Sources: Plánované hospodárství, No. 3, 1978, pp. 40–41 and No. 1, 1982. Stavivo, No. 7–8, 1981, p. 292 and Ropa a uhlie, No. 9, 1981, p. 507.

Production enterprises, too, have not entirely escaped the impact of rising energy prices and tightened allocation norms. Yet as long as these economies remain basically administratively directed and managed, which—with the exception of Hungary-is still the case, even scarcity prices may be insufficient to induce large scale conservation in the inter-industry sector. As to administrative measures, the vertical structure of management, which again is the rule apart from Hungary, permits strong ministries to ignore or subvert even officially promulgated target programs on conservation. As shown later, considerable success has been achieved by administrative measures and the application of technology in the GDR. That country and Hungary have done much already to moderate the energy intensity of their economies. The record of the others, however, is much poorer and the long term outlook is less encouraging even for these two states.

## IV. IMPACT ON PRIVATE MOTORING AND HOUSEHOLD ENERGY CONSUMPTION

In recent years, and particularly after the second oil shock, all states in Eastern Europe, with the probable exception of the GDR, moved in some fashion to restrict energy consumption by private automobiles and households very considerably, with savings of oil products being the chief concern. Direct rationing of gasoline, however, has been introduced only in three countries, Poland, Yugoslavia (which is not part of the Soviet Bloc) and, via the prohibition of driving on alternate days according to serial number, in Romania. Substantial price hikes throughout the region were also used to dampen consumption. In Romania, the pump price today is over

$6.00 per US gallon at the official exchange rate, while elsewhere they are close to Western levels.[31] However, statistics available for 1981 show that the number of light automobiles per 1000 population in East Europe is still relatively modest (in the GDR roughly half that in Italy, in Hungary well below that in Portugal, in Poland, Bulgaria and Romania much lower yet).[32] That means much savings here could not be expected. The roughly 500 million US gallons consumed by private cars and motorcycles in the GDR and 206 million in Hungary during 1980, for example, represent a mere 7 percent of all petroleum used in the former and 5 percent in the latter state. In the EEC, this share is more like 20 percent.[33] It is also revealing that while private cars and motorcycles in Hungary are responsible for almost a half of all passenger transport today, they still consume only a quarter of all liquid fuels used by road vehicles.[34]

In most East European states, a further growth of motorization may be anticipated, though at a much slower rate than during the 1960's and 1970's. Hungarian specialists, for example, expect private car stocks in their country to increase 2.6-fold by the end of the century; in Bulgaria, they should double. Gasoline consumption, however, should rise much more modestly, in the 25–50 percent range, both because of mileage improvements (currently, cars produced in the CMEA are some 15 percent less fuel efficient than modern Western models) and less intensive use. Higher gas prices, in fact, have already depressed utilization intensity but experts consider much further sharp reduction in vehicle use inadvisable and irrational.[35] In Czechoslovakia and the GDR further increase in the stock of private automobiles should now be rather modest,[36] but in Poland the future is more uncertain. Many thousands have prepaid but have not acquired vehicles before 1982 (private cars being regarded as a means to soak up accumulated consumer savings and ease the inflationary pressure) and a significant growth in stock is at least a possibility.

Households in the three northern states of Eastern Europe receive virtually no refinery products for space and water heating and all evidence points to the continuation of this situation. They do receive some natural gas but it accounts for a mere 5–6 percent of their energy use.[37] In Hungary, but probably also in Romania and Bulgaria, hydrocarbons are somewhat more important as household fuels (oil and gas providing some 30 percent of space and water heating in Hungary)[38] but sharply rising prices are depressing their use. Throughout Eastern Europe, the largest share of household energy supply still comes from solid fuels: from 45 percent in Hungary, to close to three-fourths in Poland, despite the tremendous burden this continues to place on the population and the environment.[39]

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[31] Heti Világgazdaság, October 8, 1983, p. 41; Trybuna Ludu, February 1, 1982, p. 2; February 6–7, 1982, p.5.

[32] Heti Világgazdaság, November 5, 1983, p. 34.

[33] Private cars in the GDR consumed 800 liters of gasoline per car in the late 1970's. In 1977, 133.4 private cars were registered per 1000 inhabitants; in addition there were 1.3 million motorcycles. Ibid., p. 474 and Deutschland Archiv, No. 1, 1979, p. 1165. Hungarian consumption is given in Kozponti Statisztikai Hivatal, Iparstatisztikai Évkönyv, 1980 (Budapest, 1981), p. 278. Polish consumption amounted to 1.7 million tons, i.e., 615.4 million U.S. gallons, in 1981 or about 17 gallons per person. Zycie Warsawy, January 21, 1982, p. 1. In the EEC as a whole, road transport consumed 29 percent of all refinery output, with passenger cars accounting for the bulk of it. OECD, Energy Balances of OECD Countries, Paris, 1983, p. 45.

[34] Figyelö, No. 26, 1983, p. 11 and No. 36, 1982, p. 7. All road vehicles consume 20 percent of all liquid fuels.

[35] Figyelö, No. 36, 1982, pp. 1 and 7 and Zhelezoputen transport, No. 11–12, 1981, p. 7.

[36] Hospodářské noviny, No. 16, 1983, p. 2.

[37] Gospodarka materialowa, Nos. 13–14, 1980, p. 435 and Warmelehre und Wärmewirtschaft, Band 26, 1979, p. 21.

Given the decentralized nature of this sector and the enormous variety of heating apparatus, direct rationing, apart from the restricted allocation of oil products and sale of oil stoves, is generally unfeasible even in command economies. They, too, have to rely on the price mechanism to depress usage. Still, Romania introduced not only huge price increases for all energy forms supplied to households, but also rationing of electricity through regulated daily blackouts, cessation of TV programs, temperature inspection and the like. The permitted household temperature in Romania is already below 59°F. In November 1983, the authorities announced their intention to cut household energy consumption by one-half, thus reducing its share in aggregate demand from an already puny 7.3 percent to below 4. Oversee committees in housing complexes and districts are to monitor against overconsumption, which may result in supply suspension to the entire neighborhood.[40] No other East European government, however, has been willing to squeeze the household sectors that hard. In Hungary, for example, natural gas and heating oil prices to households did not even double between 1973 and January 1983 and energy costs at the latter date comprised only 4 percent of the average household budget, less than the expenditure on hard liquor.[41]

Much wasteful use in this sector, however, is due to various technical obstacles arising from poor design, age or layout of apartment buildings, furnaces and neighborhood heating plants not constructed with energy saving goals in mind.[42] Pressure to ease the housing shortage inevitably resulted in a vast stock of poorly designed and insulated housing units which can be retrofitted only gradually and at considerable expense. As a Polish authority put it recently, "if we do not change the technique of erecting and finishing our residential units, we will be forced to allocate all the energy available in the country just to heat these buildings as early as the beginning of the 21st century."[43] Hungary now provides low cost credit to its population for insulation and retrofitting, has successfully improved the design of new furnaces for smaller apartment blocks and is about to start the manufacturing of metering devices for centralized heat supply, which so far has not been measured at the consumer end at all.[44] All this may help check the growth of household energy use which, in sharp contrast to that in other sectors of the economy, has continued unabated after 1978.

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[38] KSH, Iparstatisztikai Evkönyv, 1980, p. 278 and Energetica, No. 10, 1981, p. 423.

[39] Figyelö, No. 16, 1983, p. 7 and L. Dienes and Nikos Economou, op. cit., p. 43. In Poland, 9 million household stoves and 6.5 million cooking ranges burn a tenth of all inland supply of hard coal and account for 15–20 percent of all atmospheric pollution. Trybuna Ludu, October 21, 1981, p. 1; Gaz, woda, technika sanitarna, No. 7, 1982, p. 99 and U.N., ECE, An Efficient Energy Future, London, 1983, p. 27. In East Europe as a whole, solid fuels account for 48 percent of energy use of buildings of all kinds and this amounts to three-fifths of total solid fuel use.

[40] Heti Világgazdaság, May 7, 1983, p. 13 and December 3, 1983, pp. 6–7; and RFE, Romanian Situation Report, February 19, 1982, p. 19 and July 22, 1982.

[41] Figyelö, No. 16, 1983, pp. 1 and 7.

[42] Figyelö, No. 41, 1982, p. 9 and No. 22, 1983, p. 9.

[43] Trybuna Ludu, August 10, 1981, p. 4.

[44] Figyelö, No. 16, 1983, p. 7.

## V. Improving Energy Use by Production Enterprises

Per unit value of output, energy can be conserved in basically three ways: by (1) housekeeping approach aimed at eliminating waste by better monitoring and maintenance without changing production functions; (2) the substitution of other inputs (capital, labor, other materials) for energy; and (3) the substitution of different energy forms for each other in their technological, sectoral, and regional dimensions. In the short run, all substitution and allocation must take place essentially within the confines of existing technology and the sectoral-geographic structure of the economy. In the longer run, however, the creation of new technologies which save inputs or increase the flexibility of substitution and promote adjustments to higher energy costs becomes the chief engine of the conservation process.

In centrally planned economies the housekeeping approach and the substitution strategy do not automatically complement each other and may even be in conflict. In Gustafson's words, the first is regarded as an enforcement and monitoring problem and is handled through so-called "public organizations," largely at the local or enterprise level. The second, involving significant investment and change in material inputs, is handled through the central planning system.[45] While enterprises and organizations are pressured or ordered to submit proposals for better energy management, both the plans and their implementation depend on their being perceived to be congruent with the self interest of the production units. The energy allocation norms per unit of output themselves can only be established from information supplied by the individual enterprises, since the wide variations in the type and, still more, age of equipment make any standardized norm-setting impossible. Monitoring energy use by plant management and personnel and monitoring the enterprises by higher organs also depend on the level of technology, especially the availability of metering and automatic devices.

Two countries where reasonable congruency between these two levels of energy management seems to exist are the GDR and Hungary, even though their approaches to the problem are quite different. In the GDR, the extraordinary reliance on a single, low grade fuel requiring heavy processing and conversion (supra) resulted in very close attention paid to the technical aspects of energy efficiency. Metering, statistical evidence at each stage of energy flow, utilization of secondary energy, etc., have become much more developed than elsewhere in Eastern Europe. This, of course, has been facilitated by the traditional Prussian concern with technical efficiency, management methods and detail and husbandry towards resources. The GDR was thus able to promote Energiebewusst (energy awareness) among its managerial personnel at all levels and even among the general public. This conspicuous "energy awareness," which is generally missing elsewhere in the CMEA, may be credited with a sizeable contribution to the success of conservation in the GDR. In addition, the prominent role of the 222 integrated Combines (each having the right to shift resources among its production units in order to maximize its overall performance) in efficient energy management may be mentioned.[46]

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[45] Thane Gustafson in U.S. Congress, Office of Technology Assessment, *Technology and Soviet Energy Availability*, U.S. Government Printing Office, 1981, p. 231.

Two notions are central to the East German conservation effort—Prozessanalyse and Kontingentierung. The first denotes the systematic combing of all energy-intensive enterprises for potential energy improvements. Both outside and in-house specialists are required to cooperate in periodic (every two-three years) review of energy consumption. Kontingentierung involves rationing according to state standards and other norms. Since 1979, the rationing of various energy forms has spread to virtually the entire production sphere and is coupled with an exceptionally strong punitive arrangement for over-quota deliveries: firms must pay 10 times the regular price for above-the-norm energy use. While regular Prozessanalyse helps ensure reasonably accurate quotas, the multiplicity of norms (in the GDR heavy machine-building industry alone about 550 energy consumption norms have been set) still affords much opportunity for padding, if such is desired. It is admitted that norms providing for twice the actual consumption are not a rarity.[47]

In general, however, the East German Kontingentierung seems to be successful, unlike the rationing schemes in most other East European states. The motivation to save energy and the punitive arrangements for wastage can be operationalized because both the institutional and technical arsenal and the logistics of conservation are in place. The record has been impressive. By 1981, the annual increment of primary energy demand has fallen to 0.3 percent, compared to 3.9 percent in 1976. During the entire 6 years, energy use grew by 16.3 percent, while national income produced by 33.8 percent, giving average yearly rates of 2.55 and 4.95 percent respectively.[48] GDR specialists claim that, according to their calculations, the 1976-80 FYP economic targets could have been met with a growth rate of energy input one-third below the actual: consequently, further ambitious energy savings are scheduled for the current Plan. East German experts acknowledge that opportunities for continued energy savings through better "housekeeping" are being rapidly exhausted, but they expect improvements in technology to carry on the process.[49] Whether such capital/technology substitution for energy under the current investment constraints can proceed at sufficient speed, however, remains to be seen.

In Hungary, the emphasis has been on monetary instruments, such as pricing and credit policy, to spur energy conservation both via better housekeeping and substitution for and among energy sources. While not renouncing "authoritative" measures, planners in that country do regard commands and bans as steps of last resort in energy policy. As elsewhere in the region, the specialists who appreciated the warning of 1973 did not wield enough clout to push through a coherent conservation program until the advent of the 1979-1980 oil shock. However, the NEM (New Economic Mechanism), despite its setbacks during the 1970's, succeeded in making the idea of the market, guided by prices closely linked to world economic conditions, politically palatable. Under the trauma of huge balance of payment difficulties and the second energy shock, the 1979-1980 price reform adopted world price ratios in the material production sector "in order to subject firms and industries to international standards of profitability and force them to economize on energy and raw materials." [50] Therefore, when the 1981 Energy Management Program was announced, which for the first time in any FYP focussed on the demand rather than the supply side, monetary levers could be put to use immediately.

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[46] Of these, 156 report directly to central authorities, the rest are under Bezirk jurisdiction. Informationen, No. 6, 1983, p. 11.

[47] Energieanwendung, No. 1, 1981, pp. 3-4; Energietechnik, No. 12, 1982, pp. 463-465 and Voprosy ekonomiki, No. 1, 1982, p. 107.

[48] Energietechnik, No. 12, 1982, p. 462.

[49] Both of these claims were found in the Bulgarian source Ikonomiceska misul, No. 8, 1982, pp. 110-111.

In addition to pricing policy, a creative financing policy has been put into effect to spur more long-term conservation, especially via the substitution approach. The current Five Year Plan earmarks 30,000 million Fts (ca. $673 million) to help finance investment in energy conservation and in the substitution of gas, coal and electricity for oil products. Half of this investment has been directed into a specific state Action Program aimed at conserving 80,000 tons of oil equivalent of energy per year and to substitute gas, coal and electricity for an additional 40,000-50,000 tons of petroleum products per annum. Among the latter are the electrification of about 250 km of railroad, the import of coal-fired power station equipments from the West and the hook-up of 100-120 thousand housing units to the gas network. Sixty-three percent of all available financing is represented by state and bank loans in roughly equal proportions and another 12 percent by direct state grants. Bank loans are advanced for 30 percent of the initial investment of conservation projects; state financing may be secured for up to the entire cost, provided the saving is in petroleum products and coke. For that ambitious conservation program Hungary was able to obtain World Bank financing of $109 million.[51]

Altogether, the results so far achieved are impressive. Measures introduced in 1979-1980 brought about a 2.6 percent drop in the energy intensity of the economy in 1981, with a further decline in the following year. In the four years of 1978-1982, national income grew by 5 percent while aggregate energy use increased by a mere 1 percent or so.[52] Even more importantly, perhaps, and much welcomed, energy savings and substitution for hydrocarbons are being achieved at outlays well below planned costs.[53] Still, while gratified, Hungarian economists remain cautious. They point out that economic slowdown, structural shifts away from energy intensive industries and mild weather were responsible for about two-thirds of energy savings, with conservation proper accounting for only one-third.[54] They believe that a 0.5 energy elasticity (Δ energy demand/Δ GNP) for the rest of the decade is possible to achieve, but much further reductions, closer to a "no-energy growth" model, are seen as unrealistic.[55]

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[50] Közgazdasági szemle, No. 9, 1981, pp. 130-31.

[51] Figyelö, No. 19, 1983, p. 5 and RFE, Background Report/144, July 8, 1982, pp. 5-6; Heti Világgazdaság, July 9, 1983, p. 8 and November 5, 1983, p. 46.

[52] Heti Világgazdaság, November 5, 1983, p. 46 and Figyelö, November 5, 1982, p. 1.

[53] Figyelö, No. 19, 1983, p. 5.

In contrast to East Germany, Hungarian planners see a significant move towards energy autarchy as unfeasible and regard energy policy and conservation as simply components of the overall economic and trade strategy of a highly open economy. Even with rising production of domestic coal and new nuclear plants going on stream, the country will still depend on imports for half of its energy needs. While the necessity of increased investment in both conservation and domestic energy output is widely accepted, the extent of investment shift from actually or potentially export-earning industries is an unresolved and widely debated issue among Hungarian specialists. Those both against and for greater energy autarchy acknowledge that the generally poor export performance of processing branches (and the consequent price concessions required to maintain foreign sales) have pushed capital coefficients in these industries practically even with those in resource production. This means that increased mineral and energy imports, paid for by such exports, do not save capital for the economy and may in fact result in indirect capital export if they are compensated by Hungarian resource (including agricultural) products. Yet given the global comparative disadvantages of domestic energy and other industries, their forced development could lead the economy into a cul-de-sac. The upgrading and modernization of export-oriented processing industries is regarded as imperative for the long-run viability of the country's economy.[56]

The apparent success of Hungarian conservation effort is justly associated with its peculiar system of economic managment and market orientation. The applicability of the Hungarian experience to the rest of East Europe, however, is highly questionable. The recent Polish reform attempts are a case in point. On the surface, many of the measures introduced in Poland since 1980, however half-heartedly, seem to be modelled on the Hungarian blueprint. Yet many of these measures have been introduced piecemeal in a haphazard fashion and the Polish press has repeatedly stated that their impact on conservation has been next to none.[57] For example, controlling the prices of raw and primary materials, even if at increased levels, while allowing output to be sold at prices negotiated with the buyer is not likely to encourage conservation. The Polish case seems to prove that the countries which had failed to infuse market principles into their economy during better days may have irrevocably lost their chances at market-based conservation.

To be sure, in Poland the lack of a genuine commitment to the market and want of competence in matters of energy and economic policy on the highest echelons may be the real problem. While virtually the entire energy community is pressing for energy conservation via economic levers (prices, tariffs, loans, etc.), these experts have never been represented in government. The office of the ministry of Mining and Energy had passed from a civil to a mechanical engineer then to a general (now at the post) and energy specialists are absent even from the Parliamentary Commission on Mining and Energy.[58] In fact, management policy is already tilting away from the feable market experiments towards tightening of allocations and recentralization of decision-making. Polish observers suggest that the urgency of energy conservation is being used by centralizers to curtail the autonomy of enterprises and cripple the modest reforms.[59]

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[54] Heti Vilaggazdaság, November 5, 1983, p. 46.
[55] Figyelö, No. 45, 1982, p. 4.
[56] Ipargazdasági szemle, Nos. 1-2, 1982, pp. 70-75.
[57] Przeglad techniczny-innowacje, No. 9, 1982, pp. 11-12, and No. 5, 1983, p. 14; also Życie gospodarcze, No. 11, 1983, p. 3 and No. 21, 1983, p. 11.

Meanwhile the energy intensity of Polish national income (kilocalories used per unit of NI in constant prices) soared: by 13.2 percent between 1975 and 1980 and by 16.5 percent between 1980 and 1982, the latter rise due chiefly to the sharper drop of national income than that of energy use.[60] The 1983–85 economic plan envisages a 5.3 percent decline in energy intensity as compared to 1982, which would still be well above the 1980, let alone 1975 level, but prospects for achieving it are poor. Centralized investment into conservation continues to be very meager: 15 billion zlotys in 1984 and 1985 combined, compared to 100 billion zlotys of state subsidies to unprofitable coal mines, for 1981 alone.[61]

Energy policy in Romania seems to be in similar disarray. Romania appears far and away the leader in East Europe in the number of press articles and official speeches extolling the virtue of conservation, but coherence and feasibility in the program (if there is such a program) are sadly lacking. The leadership has projected quantum leaps in domestic coal output plus a sharp reversal in the decline of oil production and capital needs for such ambitious plans clearly preempt any meaningful allocation of funds to conservation. At the same time, totally unrealistic energy saving goals are projected: an at least 40 percent reduction in the energy intensity of the industrial sector during the 1980's and a further 2.6-fold reduction from the 1980 base by 2000.[62] These are to be chiefly achieved by directives and other administrative measures. Many of these, however, seem to be badly timed, to lack coherence and appear out of tune with the realities of the energy balance. For example, the decree for mandatory installation of electric ranges in new dwellings after 1978 was predicated on a projected leap in coal and nuclear-generated electricity as a substitute for kerosene and natural gas. The leap having failed to materialize, the move, thermodynamically wasteful, also resulted in increased oil and gas consumption as well, since most electricity is still produced from these fuels with the ususal three to one energy loss in the conversion process.[63] Similarly, the arbitrary cut-offs of electricity and fuel to production units and the urban economy often result in a greater output loss than energy saving and, therefore, are counterproductive in the battle to lower energy intensity,[64] e.g. the agricultural disaster brought on by the 50 percent arbitrary reduction of motor fuel to that sector in July 1980.[65]

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[58] Przegląd techniczny-innowacje, No. 22, 1982, p. 5.

[59] Przegląd techniczny-innowacje, No. 18, 1983, pp. 9 and 10.

[60] Życie gospodarcze, No 35, 1982, p. 6; Gospodarka materialowa, No. 9, 1983, p. 258.

[61] Życie gospodarcze, No. 11, 1983, p. 3 and No. 24, 1983, p. 9.

[62] Revista de statistica, No. 11, 1979, p. 45.

[63] Revista economica, No. 21, 1979, p. 15.

[64] RFE, Romanian Situation Report, February 19, 1982, p. 18.

The Czechoslovak experience illustrates most clearly the consequences of a persistent attempt to squeeze the conservation effort into the Procrustean bed of a rigid command economy. In that country, conservation programs, established centrally by the Federal Ministry for Technical and Investment Development and the Central Planning Board, have become part and parcel of the official Plan since the start of the 1970's. In implementing these targets, however, the program was twisted and bent to match exactly the ministerial mesh, with no arrangement to accommodate, let alone foster, inter-firm complementarity and cooperation. Similarly, the all-important goal of plan fulfillment has interfered with the implementation of energy price hikes. An escape hatch was opened for enterprises: where the effect of increased energy prices exceeds 0.14 percent of total outlays, firms are allowed additional funds for energy procurement. This effectively shields energy intensive branches from the impact of higher prices.[66]

The compartmentalized information and command structures facilitate the statistical manipulation and adulteration of the flow of information related to energy use, made easier by the woeful shortage of monitoring devices. The Czechoslovak press is full of reports stating that at a host of enterprises conservation quotas are met or overfulfilled while, at the same time, energy consumption per unit value of product is growing. Energy savings from various housekeeping and simple substitution measures (i.e. insulating pipelines, hot water mains, various repairs and tune-ups of furnaces, etc.) are entered as new gains year after year.[67] Indeed, the highest overfulfillments are reported in small-scale conservation measures where the "effects" are estimated by enterprises themselves and where controls by higher organs are poor. The so-called "specific actions", i.e. larger projects with outlays of more than 10 million crowns, are monitored more thoroughly, and it is here that recorded conservation results in most ministries fall short of targets. "Specific actions" have difficulty in finding their way into plans of industrial associations and enterprises because of capital and equipment shortages and lack of technical documentation, such as that available through years of Prozessanalyse in the GDR. As a consequence, these more ambitious conservation measures are increasingly being postponed: in 1981, only two of the planned 36 "specific actions" were started and in 1982, out of 23, not a single one.[68]

It is, therefore, not surprising that while the energy intensity of national income in Czechoslovakia has been falling in much of the postwar period (1961-65) was a significant exception) [68a] the rate of that decline has slowed very noticeably and has come to a halt in 1980-82. There is much evidence that the relatively rapid decline in energy intensity in the early 1970's was due mainly to structural changes and not to conservation (a shift in emphasis from metallurgy and other primary branches to processing industries and a sharply rising share of hydrocarbons in the fuel mix). In the mid 1970's these structural shifts have been reversed. Not only has the consumption of oil and gas peaked, and declined in 1982, but the stress on primary industries, including ferrous and non-ferrous metallurgy, was renewed and the previously started petrochemical program implemented.[69] (Only in 1981 did the leadership finally begin to put the brakes on steel consumption.) The planned rate of industrial growth for 1976-1980 had extrapolated the high rates of the previous five years, blithely projecting a 40 percent increase in energy use called for by the high material intensity.[70] Given these developments, it is highly probable that the sharp decline in the growth rates of national income and industry (national income increased by a mere 0.2 percent in 1981, with a planned growth rate of 0.5 percent for 1982)[71] may actually have pushed energy intensity up again, as was the case in the first half of the 1960's.

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[65] Quoted in the Polish source, Zycie Warsawy, No. 57, 1981, p. 5.

[66] Plánované hospodářství, No. 6, 1980, p. 18 and No. 3, 1981, p. 65.

[67] For example, see Plánované hospodářství, No. 3, 1981, p. 64 and Hospodářské noviny, No. 31, 1982, p. 2.

[68] Elektrotechnický obzor, No. 8, 1981, p. 419 and Hospodářské noviny, No. 31, 1982, p. 2.

[68a] During that period, Czechoslovak national income stagnated while energy (and material) inputs continued to rise at a moderate rate, resulting in an *increase* of energy intensity.

Czechoslovak sources forecast an extraordinarily tense fuel and power situation for 1983 because of the poor results of conservation efforts so far, the tightness in fuel supplies and delays in the nuclear program.[72] As in Romania, planners have fallen back on arbitrary cut-backs and rationing. Already during 1977-80, about 37,000 enterprise vehicles were taken out of service, with another 10-30 percent reduction slated for the 1981-85 period. Seasonal power cuts today are also common. Factories, which rely heavily on liquid fuels are finding their output programs stabilized or cut back irrespective of their original production goals established in the Five Year Plan.[73] One has reason to doubt whether in such an environment a coherent, long-term conservation program, congruent with overall energy and economic policy can be promulgated and successfully carried out.

## VI. Conservation, Energy Policy and Investment Constraints

In the longer haul, simple housekeeping and rationalization measures alone, whether implemented through market forces or administrative orders, will not suffice to improve the economic efficiency of energy use. Conservation must proceed through replacement of equipment, through technological innovation and through substituting more abundant energy forms for scarcer ones. The latter, of course, is also impossible without wholesale equipment changes and modifications and it is likewise tied to prospects of expanding coal and nuclear output, a subject treated above.

The most promising area of energy saving via the addition of new capital is represented by the recovery of secondary energy, i.e. waste gases, waste heat and the like. While the utilization of combustible gases in East Europe is already well advanced, the recovery of waste heat can still be much expanded in every state (Table

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[69] *Hospodářské noviny,* No. 38, 1981, p. 9 and No. 4, 1982, p. 2; *Politická ekonomie,* No. 2, 1981, p. 153.

[70] This is based on the analysis of a Hungarian scholar in *Gazdaság,* No. 1, 1983, pp. 110-23.

[71] The Journal of Commerce, February 14, 1983, p. 11A.

[72] RFE, Czechoslovak Situation Report, June 24, 1983, p. 14.

[73] The Journal of Commerce, November 2, 1982, p. 4C, and Heti Világgazdaság, September 10, 1983, p. 16.

3). However, the cost of such heat recapture tends to rise markedly as easy opportunities in the highest temperature ranges are exhausted. The remaining half of feasible heat recovery shown in Table 3 should thus be significantly more expensive. At any rate, the quantities of secondary energy recovered in 1980 within East Europe totaled some 18 million tons of oil equivalent. Doubling the recovery of waste heat and expanding the utilization of combustible gases and other fuel wastes by 36 percent through the decade (thus pushing re-use to near the feasible limit) would augment the five countries' energy supply by an equivalent of another 10 million tons of oil (Table 3). While no mean sum, this new saving amounts to only 2.4 percent of East Europe's aggregate energy consumption in 1982.

TABLE 3.—THE UTILIZATION OF SECONDARY ENERGY IN EASTERN EUROPE

| | Waste heat | | | Combustible gases | | |
|---|---|---|---|---|---|---|
| | | | | 1980 | | |
| | 1,000 tons of oil equivalent | Percent of possible recovery | 1990 (projected) 1,000 tons of oil equivalent | 1,000 tons of oil equivalent | Percent of possible recovery | 1990 (projected) 1,000 tons of oil equivalent |
| Bulgaria | 880 | 50 | 1,520 | 375 | 87 | 8,050 |
| Czechoslovakia | 880 | 65 | 1,640 | 2,520 | 80 | 2,210 |
| GDR | 1,130 | 44 | 1,800 | 2,270 | 87 | 2,800 |
| Hungary | 350 | 45 | 610 | 535 | 85 | 600 |
| Poland | 1,050 | 45 | 2,940 | 3,430 | 82 | 7,200 |
| Romania | 1,680 | 50 | ND | 2,700 | 90 | ND |

Note.—Figures rounded.

Sources: Cols. 1, 3, 4 and 6 from Energetika (Prague), No. 10, 1980, p. 451. cols 2 and 5 from Horizont (East Berlin), No. 2, 1982, p. 22, Romanian absolute figures are for 1977 from Revista Economica, No. 40, 1979, pp. 1–2.

Replacement of fuel-wasting equipment constitutes a much larger and truly enormous reserve for energy saving throughout Eastern Europe. In Hungary, for example, of the 6,000 large capacity furnaces subject to centralized and regular safety inspection at the end of the 1970's, 18 percent were over 50 years old.[74] In Czechoslovakia, 30 percent of all boilers and 60 of all mining machines have depreciated below 0.[75] Some 5,000 of Poland's 11,000 boilers (45 percent) operate at below 60 percent efficiency, with many not even reaching 40 percent. However, at current rates of production Polish industry would need 60 to 80 years to replace the over-aged stock of furnaces, boilers and residential stoves.[76]

All such obsolete equipment should be replaced, but the expense is huge—and in the current investment pinch the funds are simply unavailable. Recently, Czechoslovak specialists have made detailed estimates of the cost of conservation through replacement of various industrial equipment and through diverse technological processes some of which are shown in Table 4. Aside from the catch-all category of "other savings," only the utilization of waste heat through heat exchangers provides energy at a cost below the (average) cost of domestic brown coal. The very much higher values in parentheses from a later source suggest either cost escalation through the decade and/or the probability that these costs originally had been underestimated. Since waste heat recapture by heat exchangers is already moderately well advanced, further big savings must come chiefly from categories I, II and IV (Table 4), which are far more expensive, approaching or far exceeding the marginal cost of energy from purchased oil on the world market today. (It is assumed that residual fuel oil is available at the cost of medium grade crude oil). Polish studies also confirm the very high capital cost of conservation through modernization and equipment changes. According to the Chief Inspectorate of the Energy Economy, the saving of 16.4 million tons of oil equivalent in this decade would require an investment of 160 billion zlotys or 9,760 zlotys per ton.[77] With only a two year average lead time on installation and a 10 percent charge on capital, that cost would surpass 11,800 zlotys, more than the cost of Russian crude (at the commercial exchange rate of 72 zl/ruble) through the better part of this decade. However, given Poland's very grave difficulties in paying for hard currency imports, the cost of this conserved energy would still fall below the cost of oil from the world market by 50-60 percent.

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[74] Figyelö, No. 10, 1978, p. 5 and Energiagazdálkodás, No. 9, 1978, p. 381. Another 18,000 furnaces not subject to centralized inspection must be even less modern. Of coal burning industrial furnaces 57 percent were over 30 years old in 1978.

[75] Energetika, No. 4, 1981, p. 172 and Rude Pravo, October 13, 1980, p. 8.

[76] Nowe Drogi, No. 10, 1979, p. 122; Życie gospodarcze, March 21, 1982, p. 10 and Przeglad techniczny—innowacje, No. 27, 1983, p. 18.

TABLE 4.—COST OF ENERGY SAVING THROUGH VARIOUS CONSERVATION MEASURES IN CZECHOSLOVAKIA, 1975

[In crowns per 7 million kcal]

| | | |
|---|---|---|
| I. Modernization and reconstruction of boilers | 5,219 | (11,000) |
| II. Reduction of losses in fuel and energy distribution (utility steam, gas and electric power network; transport and distribution of coal, etc.). | 1,905 | |
| III. Other measures in the electric power sector | 482 | |
| IV. In furnace and chemical uses, other "technological processes" (average) | 1,813 | (8,000) |
| Of which: | | |
| Utilization of waste heat | 222 | (300) |
| Application of semiconductor technology | 3,117 | |
| V. Other savings | 195 | |
| Production cost from brown coal | 247 | |
| Cost from synthetic gas | 1,161 | |
| Cost from electricity (presumably includes nuclear) | 2,900 | |
| Cost from purchased oil ($27.40/b) at official exchange rate (6.20 Kcs/1$) in 1982 | 860 | |
| Cost from purchased oil at realistic (black market) exchange rate (24 Kcs/1$) in 1981 | 3,325 | |

Source: For all except last two categories, Statistika, Nos. 1-2, 1977, p. 39. Those in parenthesis from Plánované Hospodárství, No. 1, 1979, p. 19.

The policy of better allocation and substitution among energy sources and forms aims principally at the replacement of hydrocarbons, especially oil. Such modifications of the energy mix also require tremendous capital outlays. Generally, that approach is, or is to be, pursued most vigorously in countries most heavily dependent on such fuels. Ninety-three percent of total Romanian energy saving during 1981-85, for example, is reportedly targeted on hydrocarbons, partly through straight conservation, but largely through replacement of fuel oil with coal and, later on, nuclear power.[78] In Hungary, oil consumption has been already reduced by about one-fifth, although natural gas here has played a more important role in substitution than coal.[79] In the northern nations, overwhelmingly coal-based, the substitution and conservation strategies are less focussed on hydrocarbons and the ambitious nuclear program, especially, is aimed to ease the pressure on coal.

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[77] Przegląd techniczny—innowacje, No. 16, 1982, pp. 8-9.
[78] Materials and Society, No. 1, 1981, p. 110.

To be effective, however, this strategy of replacing fuel oil by coal and nuclear power, must be combined with an equally capital intensive simultaneous restructuring of refinery output towards more light products, especially motor fuels, allowing stationary (or smaller) crude imports to satisfy demand. In Hungary and Czechoslovakia there is clearly much room for lightening the refinery mix and such a move appears rational. To a much lesser degree, the same may be said of Bulgaria and the GDR. Hungary is, in fact, completing its first modern cracking facility and is about to close 12–13 percent of its obsolete distillate capacity.[80] The other three states also plan to move in this direction (Table 5). In Poland and Romania, however, the share of residual fuel oil is already far lower and the contribution of catalytic and other secondary processes is very respectable.[81] To whatever degree these refinery plans materialize, they are certain to put further pressure on investment resources and shift still more scarce capital from the rest of the economy into the energy sector.

TABLE 5.—THE SHARE OF RESIDUAL FUEL OIL IN EAST EUROPEAN REFINERY OUTPUT

[Percent of total]

| Country | 1980 | 1985 plan | 1990 projection |
|---|---|---|---|
| Bulgaria | 32.7 | 24.9 | 20.5 |
| Czechoslovakia | 36.1 | 32.2 | 31.7 |
| GDR | 32.6 | 29.6 | 25.4 |
| Hungary | 38.0 | 32–33 | 29–30 |
| Poland | 23.4 | 16.1 | 15.3 |
| Romania | 28.0 | 25.0 | 20.0 |

Note.—In addition to residual fuel oil, lubricants, asphalt, petroleum coke and wax comprise the heavy fractions. The latter four account for 6 to 9 percent of total refinery output, except in Poland, where it is closer to one-eighth of the total. The rest of refinery output consists of middle and light fractions (gas oil and heating oil, kerosene, diesel and gasoline), LPG and refinery gases.

Source: Chemický průmysl, No. 12, 1981, p. 656.

The mounting investment requirement of the energy sector throughout Eastern Europe, in fact, has already led to, or is rapidly leading to, serious macroeconomic distortions, especially given the current investment crunch. The new period of economic austerity (expressed in import restrictions and rising prices) has coincided with a deepening malaise among the population and labor force, which in Poland burst into a full-scale national crisis. Consumption, therefore, could not be unduly sacrificed, and defense still being sacrosanct, investment had to receive the sharpest austerity axe. Throughout the region, writes Peter Wiles, "regular growth in investment is not a principle any more; it is no longer shocking to vary it" and this may be a radical departure in thinking.[82] Beginning in Poland already in 1976 and reaching the GDR and Czechoslovakia in the early 1980's, investment is stagnant or is in absolute decline almost everywhere, dropping to a mere 16 percent of national income in Hungary by 1982.[83] Although 1983 so far shows greater investment activity through most of East Europe, no major change is expected for the next few years.

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[79] Figyelö, No. 45, 1982, p. 1 and Heti Világgazdaság, Nov. 5, 1982, p. 46.

[80] Heti Világgazdaság, July 10, 1982, pp. 35–37.

[81] Nafta, No. 12, 1979, pp. 408–411 and Revista de chimie, No. 8, 1981, p. 763.

[82] Peter Wiles, "Are There Any Communist Economic Cycles?" The ACES Bulletin, Summer, 1982, pp. 2–5 and 15.

With overall investment budgets practically stagnant, the mounting needs of the fuel and energy sector has been crowding out investment in the light industry, infrastructure and some manufacuturing branches throughout Eastern Europe. While in most of the countries the shift was relatively orderly, Poland and Bulgaria and perhaps Czechoslovakia stand out for the severity of such dislocations, aggravated by significant cost increases in energy related construction and machinery (5–6 percent per year in Czechoslovakia, for example).[84] The share of the fuel-energy sector in total Czechoslovak industrial investment soared to 39 percent for the 1983 plan, over 40 percent in Poland (1982) and as high as 60 percent in the GDR if one includes non-energy raw materials as well.[85] Yet, the Hungarian undersecretary, now minister, of industry feels that, in his country, even a 35 percent share of industrial investment directed into energy would be counterproductive, jeopardizing attempts of modernization and structural adjustments.[86] Similar sentiments are expressed by Polish specialists, who are increasingly disturbed by the drain of material and investment resources placed on the economy by the fuel and power industries—a self-perpetuating cycle, delaying structural change and even the improvement of energy utilization itself.[87]

It appears, therefore, that the manifestations of economic austerity, such as import restraints and slow growth, are affecting the long-term prospects of conservation in a contradictory fashion. They have checked the rise of aggregate energy consumption, with particular impact on petroleum, and made energy savings a priority objective everywhere. At the same time, they have caused a significant shift of resources towards low quality domestic fuels and nuclear power, diverting scarce funds from the modernization and restructuring of the economy and even from the upgrading of energy-consuming processes themselves. The vast array, technological diversity and dispersed nature of the latter make them a much more difficult target of energy policy for central planners than the fuel and power producing sector itself. Even in Hungary, with its obvious successes, the energy saving and rationalization program (now half way through its five year span) is falling short of the mark on conservation per se. It is exceeding the goal in the replacement of oil by cheaper fuels, most of which is being accomplished by a World Bank loan in targeted, well-defined fields of the economy.[88]

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[83] Ibid.; Béla Bagota and József Garam, Mit kell tudni az 1982 évi népgazdasági tervről, Budapest, 1982, pp. 45–46; Heti Világgazdaság, September 10, 1983, p. 15 and The ACES Bulletin, Winter, 1982, p. 98.

[84] E.E. Batizi, Investitsionnaia politika stran SEV, Moscow, 1983, pp. 22–23; Hospodářské noviny, No. 7, 1981, pp. 8–9.

[85] Heti Világgazdaság, September 10, 1983, p. 15; Batizi, op. cit., p. 21 and Przegląd techniczny—innowacje, No. 34, 1983, p. 9.

[86] Energiagazdálkodás, No. 9, 1981, p. 408.

[87] Tribura Ludu, January 27, 1981, p. 4: Życie gospodarcze, No. 19, 1983, p. 13; Przegląd techniczny—innowacje, No. 5, 1983, p. 15 and Energetyka, No. 6, 1981, pp. 204–206.

The investment crunch, stagnant or declining living standards reduce long-run flexibility, even as the urgency of energy conservation intensifies. As the more obvious and glaring inefficiencies are abated or eliminated, further progress involves less palpable choices and more complicated trade-offs with extended time horizons. Significant results through a better housekeeping approach have been achieved in the GDR and Hungary, but elsewhere success has been more limited. Reducing supplies to the final consumer through rationing and the price mechanism has also been employed but given stagnant or declining living standards and the small share of quality, premium fuels so allocated much more saving here should not be expected. Without whole-sale replacement of obsolete capital stock and major changes in the structure and production stream of these economies energy will be conserved mainly through stagnation, even decline, in utilized national income and sheer unavailability of supplies. An additional significant drop in world oil prices could help East Europe and increase its options, yet even that benefit could not be fully captured. Such a development would further hurt the USSR, which is already losing some $2.4 billion per year from the recent price fall,[89] causing it to demand even greater sacrifices from the rest of the CMEA. The time lag for the impact of world energy development on East Europe is likely to continue. As the energy crunch came to the region with some delay, escape from it, too, will take longer and may carry over into the 1990's.

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[88] Heti Világgazdaság, Nov. 5, 1983, pp. 46-47.

[89] Wharton EFA, Centrally Planned Economies. Current Analysis, Feb. 12, 1983.

# ELECTRIC ENERGY IN EASTERN EUROPE*

By Alex Wynnyczuk**

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## I. SUMMARY

This paper examines several aspects of the generation, consumption, and allocation of electric power in Eastern Europe. Comparisons with selected West European countries are provided as well as indications of changes that have taken place as a result of the "energy crisis".

The most important aspects of electric power generation in Eastern Europe are a growing dependence on nuclear power and increasing use of low quality brown coal and lignite. In both cases, the dangers to the environment are not only already great today, but certainly will be increasing in the future throughout the whole area. There seems to be no public discussion inside Eastern Europe of the risks connected with nuclear power plants, and very little publicly expressed concern as to damage done to the environment by burning low quality coal on a large scale.

Electric power consumption has increased rapidly in Eastern Europe since the first five year plans were initiated after the Second World War. However, today Eastern European countries still consume a smaller share of total energy in the form of electric power than comparable Western countries.

As far as the use of electric power is concerned, Eastern Europe favors the industrial sector at the expense of residential uses and services. The restructuring of manufacturing away from the traditional emphasis on iron and steel has not led to savings in electric energy yet.

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## II. INTRODUCTION

There are at least two reasons for discussing electric energy separately from other forms of energy. First, electric power is the most important form of energy in an industrialized society and, as such, its consumption is often used as an indicator of the level of economic development of a country. Second, future supplies of electric power in Eastern Europe are to come primarily from nuclear power plants and from conventional thermal power plants burning low quality lignite. In both cases, dangers to the environment and to human health are real.

This paper looks at the generation, consumption, and allocation of electric power in the six East European members of CMEA—Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, and Romania—from 1970 to 1982, as well as at possible future developments as they are planned by their respective governments or implied in the current situation. The period since 1970 includes about six years of reasonably plentiful supplies of energy, with increases coming from the Soviet Union in the form of oil and natural gas, followed by six years of rising prices for Soviet oil and also rising marginal costs of domestic production of all types of energy, including coal. For this reason, this paper also examines the changes that have taken place in electric power production, consumption, and allocation since 1975.[1] Further, to put East European data on electric power in perspective, comparisons are made with selected countries of Western Europe.

## III. GENERATION OF ELECTRIC POWER

Most of East European electric power is generated by conventional thermal power plants using coal as fuel. Oil and natural gas have not played an important role in the operation of power plants. Thus, the shift away from oil to other fuels after 1975 was not quantitatively significant, and has probably ended by now. It should not be expected that there will be significant additional decline in oil consumption by electric power plants, because the necessary byproduct of oil refining, residual oil, has no other use than as fuel for large boilers.[2]

The major developments in electric power generation in Eastern Europe in recent years have been the growth of nuclear power—generated thus far in three countries: Bulgaria, the GDR, and Czechoslovakia—and a continuous increase in the use of low quality brown coal and lignite by conventional power plants in all six countries. The figures shown in Table 1 give an indication of the relative importance of nuclear, conventional and hydroelectric power in the six countries of Eastern Europe.

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[1] In 1975 the pricing of Soviet oil delivered to Eastern Europe was changed from a fixed price set for a five year period, to a variable price equal to an average of world prices of the preceding five years.

[2] For example: The German Democratic Republic generated 3.3% of its electric power by burning oil in 1975, and 0.7% in 1982. (SJ 1982 p. 145 and ST 1983 p. 56.) Out of the total fuel used by Czechoslovak conventional power plants, oil amounted to 7.6% in 1975 and to 4.6% in 1981. (SR 1982 p. 377). Hungary used 1548 th. tons of oil in power plants in 1975 and 944 th. tons in 1981 (IE 981 p. 24). There are no comparable data available for other countries.

## TABLE 1.—EASTERN EUROPE: OUTPUT OF ELECTRIC POWER

| Year | Output (millions of kWh) | Generated by— | | |
|---|---|---|---|---|
| | | Conventional (percent) | Hydroelectric (percent) | Nuclear (percent) |
| Bulgaria: | | | | |
| 1970 | 19,515 | 89.0 | 11.0 | |
| 1975 | 25,237 | 80.2 | 9.7 | 10.1 |
| 1980 | 34,833 | 71.6 | 10.7 | 17.7 |
| 1982 | 40,438 | 65.9 | 7.5 | 26.6 |
| Czechoslovakia: | | | | |
| 1970 | 45,163 | 91.9 | 8.1 | |
| 1975 | 59,277 | 93.3 | 6.4 | .3 |
| 1980 | 72,731 | 87.2 | 6.6 | 6.2 |
| 1982 | 74,703 | 86.5 | 5.7 | 7.8 |
| German Demcratic Republic: | | | | |
| 1970 | 67,650 | 97.5 | 1.8 | .7 |
| 1975 | 84,505 | 95.3 | 1.5 | 3.2 |
| 1980 | 98,808 | 86.3 | 1.7 | 12.0 |
| 1982 | 102,906 | 87.8 | 1.7 | 10.5 |
| Hungary: | | | | |
| 1970 | 14,542 | 99.4 | .6 | |
| 1975 | 20,465 | 99.2 | .8 | |
| 1980 | 23,874 | 99.5 | .5 | |
| 1982 | 24,693 | 99.3 | .7 | |
| Poland: | | | | |
| 1970 | 64,532 | 97.1 | 2.9 | |
| 1975 | 97,169 | 97.6 | 2.4 | |
| 1980 | 121,877 | 97.3 | 2.7 | |
| 1982 | 117,579 | 97.4 | 2.6 | |
| Romania: | | | | |
| 1970 | 35,088 | 92.1 | 7.9 | |
| 1975 | 53,721 | 83.8 | 16.2 | |
| 1980 | 67,486 | 81.3 | 18.7 | |
| 1982 | 68,900 | 81.8 | 18.2 | |

Sources: Bulgaria: SG 1982 p. 206 and SS 1983 p. 90. Czechoslovakia: SR 1977 p. 367, SR 1982 p. 396 and Cisla Pro Kazdeho 1983. p. 102. German Dem. Republic: SJ 1981 p. 135, SJ 1982 p. 145, and ST 1983 p. 56. Hungary: SE SEV 1981 p. 80, SE SEV 1982 p. 70, and SE 1982 p. 192. Poland: RSP 1980, p. 313, RSP 1982, p. 194, and MRS 1983 p. 145. Romania: AS 1981, p. 187 and AS 1982 p. 92. Data for 1982 are from Revista Statistica, February 1983, Bucarest.

Shares of total output produced by hydroelectric power plants in Czechoslovakia, Hungary, Poland, and Romania are not available for 1982. The figures used are for 1981.

Bulgaria is currently among the world leaders in the nuclear field with almost 27% of its electric power coming from nuclear power plants.[3] By 1990, Bulgaria expects to produce almost 45% of its electric power from nuclear sources. Czechoslovakia hopes to obtain 70% of total planned increases in energy consumption between now and the year 2000 from nuclear power plants. German Democratic Republic hopes to increase its nuclear power capacity from current 1760 MW to 2710 MW by the end of 1985. Hungary, which is putting into operation its first nuclear power plant this year, plans to produce about one-third of its electric power generation in new nuclear power plants by 1990. The first Polish and Romanian nuclear power plants are currently in the planning stage. Altogether, the six countries expect to operate about 12000 MW nuclear power capacity by 1990, compared to 4500 MW they have today. The production of equipment for nuclear power plants is carried out by all European members of CMEA with each of them specializing in some aspects.[4]

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[3] Selected other countries that operate nuclear power plants obtained from them in 1981 shares of their total power generation as follows: France 38.1%, Sweden 38.6%, Finland 36.0%, Switzerland 28.8%, Belgium 25.4%, Japan 15.1%, West Germany 14.5%, United Kingdom 13.7%, United States 11.7%. All data from "Energy Balances of OECD Countries 1971/1981." International Energy Agency. Paris 1983.

The importance of brown coal and lignite is not demonstrated in Table 1 because available data do not lend themselves to simple comparisons. However, from scattered sources, the following information can be obtained for individual countries: [5]

Bulgaria, a country poorly endowed with energy resources, uses 80% of its lignite coal in electric power plants. In the future, new lignite deposits are to be made available, and by 1990 the amount of domestic lignite burned by power plants is expected to double.

Czechoslovakia has increased the share of brown coal in the fuel used to generate electric power from 71.7% in 1975 to 73.1% in 1981. This means that in 1981 53.2% of the brown coal available was burned by power plants, as opposed to 47.6% in 1975. Mining of new deposits will allow for increases in the use of brown coal by power plants in the near future.

The German Democratic Republic, the largest producer of brown coal and lignite, as well as the largest producer of electric power per capita in the region, generated 82% of its electric power by burning brown coal in 1982. New mines should help to increase the production of lignite by an additional 5 to 10% by 1985.

In Hungary, 43% of the fuel in power plants was in the form of brown coal and lignite in 1981. Natural gas was the second most important fuel in Hungarian power plants. Plans call for opening new coal mines in the north-eastern part of the country to supply an additional 10–15 million tons of lignite annually to be used by power plants.

Poland, the largest producer of bituminous coal in the region, with no nuclear power plants and minimal hydroelectric power, has the capacity to increase shipments of hard coal to its power plants, supplies having been reduced lately by political unrest rather than by lack of natural resources. However, Poland also has recently been developing brown coal and lignite deposits near the German border to be used in power generation.

Romania, the largest producer of oil and natural gas in Eastern Europe also plans to utilize its untapped brown coal to generate electric power, as its oil deposits are being depleted.

These official plans and unofficial discussion thus indicate that the options of expanding nuclear power plants and using more brown coal and lignite are being adopted throughout Eastern Europe. This course of action has grave implications for the environment of all countries in the area. Strip mining will continue to turn new areas into lunar landscapes, while the smokestacks of power plants (as well as large heating plants) will increase their destructive effects on the forests of Central Europe, and continue to threaten the health and general well being of the people in the area.[6] The potential dangers of nuclear power plants grow more serious as additional capacity is built and the new and rare becomes routine and common and precautions are relaxed.

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[4] Based on following sources: Planovane Hospodarstvi. (Planned Economy). No. 9, 1982, pp. 40–41. Ekonomicheskoye Sotrudnichestvo Stran—Chlenov SEV. (Ekonomic Cooperation of Member-Countries of CMEA). No. 6, 1979, No. 2, 1980, No. 5, 1980, No. 1, 1981, and No. 3, 1983.

[5] Statements on the use of brown coal and lignite by power plants in indivudual countries are based on following sources: Planovane Hospodarstvi. (Planned Economy). No. 1982 p. 3; Ekonomicheskoye Sotrudnichestvo Stran—Chlenov SEV (Economic Cooperation of Member-Countries of CMEA, No. 2, 1980, No. 5, 1980, and No. 2, 1981, SR 1982 p. 376, IE 1981 p. 250.

Furthermore, major characteristics of nuclear power plants and of new coal mines are their high capital intensity and long lead times. Given the usual problems of the construction industry, long delays are more the norm than the exception. Thus, future electric power capacities will not be coming on line in a continuous manner, but rather at more or less irregular intervals. It is thus to be expected that economic activity will be hampered—to different degrees in individual countries—by recurring shortages of electric power. Recent plans to produce and install 1000MW units in nuclear power plants, if realized, will entail new investment outlays to build larger excess capacity as a protection against planned and unplanned outages, or else there may be quite serious disruptions when reserve capacity is not available.

## IV. CONSUMPTION OF ELECTRIC POWER

Domestic consumption of electric power in Eastern Europe is somewhat different from its production because of foreign trade. The six East European members of CMEA taken together are net importers of electric energy. The imports come from the Soviet Ukraine via high voltage transmission lines to Hungary and Poland. The importance of imports is not uniform for all countries. As shown in Table 2, Hungary is currently importing about 25% of its domestic consumption, while Poland and Romania have slight surpluses in their electric power trade. With the current construction of a new nuclear power plant (4000MW) in the Soviet Ukraine and a new high voltage transmission line, with investment participation by Czechoslovakia, Hungary, Poland, and Soviet Union in exchange for future power deliveries, it is to be expected that the imports of electricity by Eastern Europe will grow. However, only Hungary will be dependent on Soviet electric power to such an extent that interruption could cause serious difficulties to her economy.

TABLE 2.—EASTERN EUROPE: DOMESTIC AVAILABILITY OF ELECTRIC POWER, 1970, 1975, 1980, and 1982

[Millions of kilowatthours]

| Year | Output | Net import | Domestic use |
|---|---|---|---|
| Bulgaria | | | |
| 1970 | 19,515 | −83 | 19,432 |
| 1975 | 25,237 | 3,713 | 28,950 |
| 1980 | 34,833 | 3,912 | 38,745 |
| 1982 | 40,438 | 2,752 | 43,190 |
| Czechoslovakia: | | | |
| 1970 | 45,163, | 3,396 | 48,559 |
| 1975 | 59,277 | 4,212 | 63,489 |
| 1980 | 72,731 | 1,839 | 74,570 |

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[6] West German concern is currently being manifested by governmental communications to Czechoslovakia and the German Democratic Republic, and by almost daily comments in the public press. See also an article in The New York Times, Nov. 6, 1983 on the problem of forests and air pollution in Central Europe.

TABLE 2.—EASTERN EUROPE: DOMESTIC AVAILABILITY OF ELECTRIC POWER, 1970, 1975, 1980, and 1982—Continued

[Millions of kilowatthours]

| Year | Output | Net import | Domestic use |
|---|---|---|---|
| 1982 | 74,703 | 1,666 | 76,369 |
| German Democratic Republic: | | | |
| 1970 | 67,650 | 400 | 68,050 |
| 1975 | 84,505 | 683 | 85,188 |
| 1980 | 98,808 | 1,465 | 100,273 |
| 1982 | 102,906 | 1,152 | 104,058 |
| Hungary: | | | |
| 1970 | 14,542 | 3,395 | 17,937 |
| 1975 | 20,465 | 4,124 | 24,589 |
| 1980 | 23,874 | 7,387 | 31,261 |
| 1982 | 24,693 | 8,741 | 33,434 |
| Poland: | | | |
| 1970 | 64,532 | 55 | 64,587 |
| 1975 | 97,169 | −513 | 96,656 |
| 1980 | 121,877 | −235 | 121,642 |
| 1982 | 117,579 | −1,685 | 115,894 |
| Romania: | | | |
| 1970 | 35,088 | −2,385 | 32,703 |
| 1975 | 53,721 | −2,505 | 51,216 |
| 1980 | 67,486 | 423 | 67,909 |
| 1982 | 68,900 | −148 | 68,752 |
| Eastern Europe: | | | |
| 1970 | 246,490 | 4,778 | 251,268 |
| 1975 | 340,374 | 9,714 | 350,088 |
| 1980 | 419,609 | 14,791 | 434,400 |
| 1982 | 429,219 | 12,478 | 441,697 |

All data on output are from Table 1 of this paper. Foreign trade data are from: Bulgaria, SE SEV 1982, p. 320, and SS 1983 pp. 148 and 162; Czechoslovakia, SR 1982, p. 376 and Cisla Pro Kazdeho 1983, p. 102. (The source gives gross power consumption per capita. Net import was calculated as the difference between output and gross consumption.); German Democratic Republic, SJ 1981, p. 134 and ST 1983 p. 57; Hungary, SE 1981, p. 198; Poland, RSP 1980, p. 313, RSP 1982, p. 194 and MRS 1983 p. 145; Romania, AS 1981 p. 202, AS 1982 p. 92, and Revista de statistica No. 2 1983. It was assumed that net import remained unchanged from 1981.

The levels of consumption of electric power in Eastern Europe are not very different from Western countries of similar degrees of industrialization. Precise comparisons are difficult without reliable measures of the degrees of industrialization, or of levels of Gross National Product expressed in a common currency. Available data, however, show that countries of Western Europe, when compared to countries of Eastern Europe with similar per capita consumption from all energy sources, use more of energy in the form of electric power. (Table 3). This is an indication either of higher energy intensity of use including waste, or of a certain degree of backwardness in energy structure in the East. It is also interesting to note that during the second half of the decade of the 1970s the differences in energy structure have actually increased. This increase is measured here by a ratio of the growth rate of consumption of electric energy to the growth rate of consumption of all energy. This measure actually overstates the achievement of countries with lower relative use of electric energy on the road towards an "all electric" society.[7]

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[7] The ratio of the growth rates of electric energy and total energy consumption measures the relative change in the share of electric power in total energy. Thus, for example, if in one country only 10% of energy is consumed in the form of electric power, while in the other country it

Continued

TABLE 3.—SELECTED EUROPEAN COUNTRIES: RATIO OF ELECTRIC POWER TO TOTAL ENERGY CONSUMPTION

| Country | 1975 | 1980 | Rate of change |
|---|---|---|---|
| Bulgaria | 1.057 | 1.101 | 1.042 |
| Czechoslovakia | 1.029 | 1.073 | 1.043 |
| German Democratic Republic | 1.101 | 1.155 | 1.049 |
| Hungary | 1.044 | 1.062 | 1.017 |
| Poland | .825 | .874 | 1.059 |
| Romania | .868 | .948 | 1.092 |
| France | 1.324 | 1.577 | 1.191 |
| West Germany | 1.322 | 1.494 | 1.130 |
| United Kingdom | 1.405 | 1.506 | 1.072 |
| Austria | 1.863 | 1.918 | 1.030 |
| Japan | 1.918 | 1.914 | .998 |
| United States | 1.317 | 1.485 | 1.128 |

Note.—The ratio of electric power consumption to total energy consumption is expressed here in terms of thousand kwh per one ton of oil equivalent. Thus, an all electric society, with approximate 35% efficiency in power generation would show a ratio of 4. (Four kilowatthours per one ton of oil equivalent of total energy use.)

Sources: Data on total energy use are from the Czechoslovak publication Cisia Pro Kazdeho 1983, p. 258. Data on electric power consumption are from Table 2 above for East European countries and from "Energy Balances of OECD Countries 1971/1981," International Energy Agency. Paris 1983, for Western countries.

It is not clear from the source how the data on total energy use were estimated. However, similar figures calculated from other available data, lead to identical conclusions.

Consumption of electric power was growing in each of the six East European countries reasonably rapidly prior to the "energy crisis", although the growth rates were not much higher than in West European countries of similar levels of economic development. However since 1975 the growth has slowed. In Table 4 there are data showing average annual growth rates of domestic consumption of electric power in selected countries, including the six East European members CMEA, for the period 1970–81 or 1971–1981 as a whole and for two subperiods. (The reason for the slight difference in the timespans selected, 1971–1981 for the Western countries and 1970–1981 for CMEA countries, is simply the availability of data.)

TABLE 4.—SELECTED EUROPEAN COUNTRIES: ELECTRIC POWER CONSUMPTION, AVERAGE ANNUAL GROWTH RATES

[In percentages]

| Country | 1970–81 | 1970–75 | 1975–81 |
|---|---|---|---|
| Bulgaria | 6.9 | 8.3 | 5.7 |
| Czechoslovakia | 4.1 | 5.5 | 3.0 |
| German Democratic Republic | 3.8 | 4.6 | 3.1 |
| Hungary | 5.5 | 6.5 | 4.6 |
| Poland | 5.4 | 8.4 | 2.9 |
| Romania | 7.2 | 9.4 | 5.3 |
| CMEA (Europe) | 5.1 | 6.9 | 3.7 |

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is as much as 50%, a twenty percent increase in the share would raise it to 12% in the first country, and to 60% in the other. It is to be expected that the growth in the relative importance of electric power is asymptotic towards less than "only electric power" in the forseeable future. Thus, the normal development to expect would be that the share of electric power in total energy will grow at a declining rate. It follows then that countries with more electric power relative to all forms of energy should experience a lower ratio between growth rates of electricity and of all energy, then countries with less electric power.

| | 1971-81 | 1971-75 | 1975-81 |
|---|---|---|---|
| Belgium | 4.6 | 6.3 | 3.4 |
| France | 5.8 | 5.0 | 6.3 |
| West Germany | 3.5 | 3.8 | 3.3 |
| Italy | 4.2 | 4.3 | 4.1 |
| Netherlands | 3.8 | 5.3 | 2.9 |
| Spain | 6.2 | 7.8 | 5.2 |
| Sweden | 3.9 | 4.6 | 3.5 |
| United Kingdom | .8 | 1.5 | .3 |
| OECD (Europe) | 3.8 | 4.1 | 3.7 |

Sources: Data for Western Europe are from "Energy Balances of OECD Countries 1971/1981," International Energy Agency, Paris 1983. Data for Eastern Europe are from Table 2. Average annual rates of growth were obtained as compound rates of change between the first and the last year of the period.

The figures clearly show a decline in the growth rates of electric power use from the first period to the second period. It is interesting to note that from 1975 to 1981 the growth rates were identical for Western Europe and Eastern Europe taken together. The difference in growth rates during the first half of seventies may be accounted for at least partly by the timing of the energy crisis. Western Europe was affected by higher oil prices as early as 1973, while Eastern Europe was not until 1975. To what degree the decline in power consumption in Eastern Europe was caused by a decline in demand for electricity, or to what degree it stemmed from inability to generate more power, cannot be determined from the figures.

## V. Allocation of Electric Power

Although uses of electric power are generally similar in all countries, the allocation of power among them may vary considerably, depending to a large degree on the level of development. Moreover, the increasing scarcity of energy during the second half of the 1970s was expected to lead to reallocation of electric power among individual groups of users.

An industrialized society consumes a large share of its electric power in the manufacturing sector. However, as consumer durables become readily available, increasingly more electricity is allocated to residential uses. This seemed to have been true for all the countries of Europe, East and West, during the last decade, as shown in Table 5. Although the figures may not be exactly comparable, it is clear that the East European countries, regardless of their levels of national income, are still in the stage of the predominance of heavy industry when only a relatively small share of electric power is allocated toward direct use by consumers.[8]

The differences in electric energy allocation to other sectors of the economy, such as agriculture and transportation are determined not only by the technological development of the sector, but also by its size. Thus, without reliable data on the size of each sector in each country, not much can be concluded from the figures in Table 5.

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[8] Differences do arise when households consume electric power indirectly, as for example through city heating system rather than directly by using small heating units in their apartments. It is believed that there is somewhat more of such indirect use of electric energy in Eastern Europe, and thus, that the residential uses shown in Table 5 are understated. Additional differences may be caused by the inclusion of consumption by farmers households in agriculture, rather than in the residential sector.

## TABLE 5.—SELECTED COUNTRIES: ALLOCATION OF ELECTRIC POWER BY SECTOR

[In percentages]

| Country | Industry | Agricultrue | Transport | Residential | Other |
|---|---|---|---|---|---|
| Bulgaria: | | | | | |
| 1970 | 67.7 | 4.3 | 2.9 | 15.6 | 9.5 |
| 1980 | 55.3 | 3.5 | 3.5 | 21.6 | 16.1 |
| CSSR: | | | | | |
| 1970 | 67.7 | 3.8 | 6.0 | 9.6 | 12.9 |
| 1981 | 61.2 | 3.9 | 5.4 | 13.9 | 15.6 |
| German Democratic Republic: | | | | | |
| 1970 | 70.4 | 3.2 | 2.5 | 12.2 | 11.7 |
| 1981 | 62.8 | 4.7 | 2.5 | 14.3 | 15.7 |
| Hungary: | | | | | |
| 1970 | 66.2 | 3.9 | 5.2 | 12.1 | 12.5 |
| 1981 | 54.2 | 5.6 | 5.7 | 19.7 | 14.8 |
| Poland: | | | | | |
| 1970 | 70.3 | 2.7 | 4.3 | 7.8 | 14.9 |
| 1981 | 60.7 | 6.1 | 4.1 | 13.0 | 16.1 |
| Romania: | | | | | |
| 1970 | 75.2 | 2.7 | 1.9 | 8.6 | 11.6 |
| 1981 | 74.8 | 5.3 | 3.3 | 8.6 | 8.0 |
| OECD: | | | | | |
| 1970 | 54.2 | 1.6 | 2.9 | 24.3 | 17.0 |
| 1981 | 49.4 | 1.6 | 2.6 | 28.3 | 18.1 |
| EEC: | | | | | |
| 1970 | 52.7 | 1.4 | 2.9 | 25.1 | 17.9 |
| 1981 | 48.0 | 1.6 | 2.6 | 29.4 | 18.4 |

Note.—Total use includes all uses other than power consumption by power plants and transmission losses.

Sources: Bulgaria: SG 1981 p. 212. Data for 1981 are not available; Czechoslovakia: SR 1982 p. 376 and 377, SR 1972 p. 253 and SE SEV 1981 p. 54 and SE SEV 1982 p. 47; German Democratic Republic: SJ 1981 p. 134, SJ 1982 p. 144, SE SEV 1981 p. 53 and SE SEV 1982 p. 47. The source gives consumption of power by power plants together with other energy sectors. It was assumed that the share of total consumption used by power plants is the same as in Czechoslovakia; Hungary: SE 1981 p. 201; Poland: RSP 1982 p. 194; Romania: AS 1981 p. 202 and AS 1982 p. 99; OECD members in Europe as well as EEC (Common Market): Data are from "Energy Balances of OECD Countries 1971/81," Paris 1983.

The consumption of electric energy by industry is determined by the size of the sector and its structure, as well as by technology. There are clearly industrial branches that are energy intensive, as for example, mining, power generation, metallurgy and the chemical industry. Below, in Table 6 are data that give an indication of the differences in electric power requirements per unit of value added by major industrial branches.

## TABLE 6.—EASTERN EUROPE: ELECTRIC POWER CONSUMPTION PER UNIT OF VALUE ADDED

[Millions of kilowatthours in 1975]

| Sector | CSSR | German Democratic Republic | Hungary | Poland |
|---|---|---|---|---|
| Energy | 655 | 1,199 | 197 | 973 |
| Metallurgy | 722 | 1,068 | 415 | 1,421 |
| Chemical | 670 | 1,239 | 227 | 1,553 |
| Building material | 422 | 654 | 157 | 811 |
| Machinery | 175 | 196 | 58 | 284 |
| Other | 231 | 253 | 76 | 311 |
| Industry | 395 | 568 | 141 | 629 |

Note.—Electric consumption is expressed here per unit of value added, measured in index numbers. For the industry sector as a whole, the figure was obtained as power consumption divided by 100. For individual branches, power consumption was divided by relative share of the branch value added in the total as given in OP-75. Thus the unit of value added is different for each country, depending on how large its industrail output is relative to other countries. For these reasons the data are comparable within each country, but not comparable among countries.

An increase in electric energy requirements per unit of output may result from an increase in mechanization, from decreasing returns to scale (as in mining), or from new technologies, as, for example, in steel making. On the other hand new technology or new materials together with energy saving measures, could lead to a decline in power consumption per unit of output. For the period 1975 to 1981, the last year for which data are available, energy using effects continued to prevail in Czechoslovakia, Hungary and Poland for industry as a whole. (Data for Bulgaria and Romania are not available). This means that the growth of electric power consumed by industry continued to outpace the growth of output (Table 7). In the case of the German Democratic Republic, energy saving measures together with structural changes resulted in a considerable slowdown in the growth of industrial use of electric power as compared to the growth of output. It was the combination of fast expansion of the machinery branch, which is a light user of electric energy per unit of value added, with a considerable decline in power consumption per unit of value added by the largest branch by far, namely the chemical industry. The success of the chemical industry in saving electric power can probably be explained by—besides a change in product mix—a shift from lignite to oil and natural gas as feedstock.

TABLE 7.—EASTERN EUROPE AVERAGE ANNUAL GROWTH RATES OF OUTPUT AND POWER USE, 1975–81

[Percentage change]

| Industry branch | CSSR | | German Democratic Republic | | Hungary | | Poland | |
|---|---|---|---|---|---|---|---|---|
| | Output | Power use | Output | Power use | Output | Power use | Output | Power use |
| Energy | 0.1 | 2.1 | 1.8 | 2.7 | 0.5 | 2.3 | 2.1 | 3.5 |
| Metallurgy | .6 | 2.0 | 2.7 | 3.2 | .6 | 2.2 | 3.3 | 4.7 |
| Chemical | 2.6 | 1.6 | 3.2 | .6 | 5.0 | 4.1 | .7 | .5 |
| Machinery | 4.8 | 2.3 | 5.0 | 2.3 | .2 | 3.3 | −2.0 | 1.2 |
| Building material | −.3 | 2.8 | 1.5 | 1.3 | 2.5 | 4.7 | −3.2 | 2.3 |
| Other | 1.6 | 2.7 | 1.7 | 2.3 | 2.4 | 4.0 | 1.9 | 2.8 |
| Industry | 2.4 | 2.6 | 3.1 | 1.9 | 1.8 | 3.0 | −1.8 | 1.3 |

Sources: The rate of growth was calculated as a compound rate between the first and last year of the period. Output data are from OP-75. Electric power consumption data are from SR 1982 p. 377 for Czechoslovakia, from SJ 1981 p. 134 and SJ 1982 p. 144 for the GDR, from SE 1975 p. 151 and SE 1981 p. 200 for Hungary, and from RSP 1982 p. 205 for Poland. There are no similar data available for Bulgaria and Romania.

## VI. CONCLUSIONS

The rapid industrialization of Eastern Europe during most of the post-World War II period was accompanied by fairly high rates of growth of production and consumption of electric power. However, all six countries of Eastern Europe still exhibit certain characteristics of electric power use that are characteristic of a lower stage of industrialization.

First, there seems to be little concern with risks posed by nuclear power plants. All the six East European members of CMEA plan—not necessarily in the same degree—fast development of new or additional nuclear power capacities during the present decade, with no public discussion of drawbacks, while most of the Western countries are taking a second look at the costs and dangers associated with nuclear power.

Second, the increasing use of low quality coal by power plants and large heating plants, partly at the expense of decentralized heat generation, has intensified air pollution in areas where the plants are located and contributed to acid rain in more distance places. Forests of Central Europe are currently dying at an unprecedented rate. When Bulgaria, Hungary and Romania open new mines and start burning additional lignite to generate power as planned, this particular environmental problem will spread through all of Eastern Europe.

Third, electric energy constitutes a lower share of total energy consumption in Eastern Europe than in Western Europe for countries of similar per capita energy use. If the trend is, as history suggests, towards an "all electric" society, Eastern Europe is still behind its western neighbors.

Fourth, all countries of Eastern Europe still favor the industrial sector in allocating electric power, especially at the expense of direct residential use. The result is that although total power consumption is relatively high, sectors such as households and services are still behind their western counterparts in electrification.

Fifth, as a result of the energy crisis in the 1970s, the growth of consumption of energy, including electric energy, has slowed down in all countries, East and West. It seems, though, that the decline in the rate of expansion of electric power was relatively larger in Eastern Europe. This implies that if the growth of power consumption continues in both parts of Europe at the same rates as it has since 1975, Eastern Europe can never "catch up."

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AS (year): Romania. Central Directorate of Statistics. Anuarul Statistic al Republicii Socialiste Romania, 19. (Statistical Yearbook of the Romanian Socialist Republic, 19.) Bucharest Published annually in the year given in the title.

IE (year): Hungary. Central Statistical Office. Iparstatistikai evkonyv, 19. (Industrial Statistical Yearbook, 19.) Budapest. Published in the year after the year in the title.

MRS (year): Poland. Main Statistical Office. Maly rocznik statystyczny, 19. (Small Statistical Yearbook, 19.) Warsaw. Published annually in the year given in the title.

OP-(No.): Occasional Paper of the Research Project on National Income in East Central Europe. L.W. International Financial Research, Inc. New York, N.Y.

RS (year): Poland. Rocznik Statystyczny, 19. (Statistical Yearbook 19.) Warsaw. Published annually in the year given in the title.

RSP (year): Poland. Rocznik statystyczny przemyslu, 19. (Statistical Yearbook of Industry, 19.) Warsaw Published annually in the year given in the title.

SE (year): Hungary. Central Statistical Office, Statisztikai evkonyv, 19. (Statistical Yearbook, 19.) Budapest. Annual. Published in the year after the year given in the title.

SE SEV (year): Council for Mutual Economic Assistance. Secretariat. Statisticheski ezhegodnik stranchlenov SEV, 19. (Statistical Yearbook of the Member countries of the Council for Mutual Economic Assistance, 19.) Moscow Published annually in the year given in the title.

SG (year): Bulgaria. Central Statistical Administration Statisticheski godishnik na Narodna Republika Bulgaria, 19. (Statistical Yearbook of the People's Republic of Bulgaria, 19.) Sofia Published annually in the year given in the title.

SJ (year): Germany, Democratic Republic. Central Statistical Office. Statistisches Jahrbuch der Deutschen Demokratischen Republik, 19. (Statistical Yearbook of the German Democratic Republic, 19.) Berlin Published annually in the year given in the title.

SR (year): Czechoslovakia. Federal Statistical Office Statisticka rocenka, 19. (Statistical Yearbook of the Czechoslovak Socialist Republic 19.) Prague. Published annually in the year given in the title.

SSS (year): Bulgaria. Central Statistical Administration. Statisticheski spravochnik na NRB 19. (Statistical Handbook of the PRB 19.) Sofia. Published annually in the year given in the title.

ST (year): German Democratic Republic. Central Statistical Office. Statistisches Taschenbuch der DDR 19. (Statistical Pocketbook of the GDR, 19.) Berlin. Published annually in the year given in the title.

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# EASTERN EUROPE'S RELATIONS WITH OPEC SUPPLIERS IN THE 1980's

By C.H. McMillan*

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## I. SUMMARY

Comecon Eastern Europe's growing reliance on OPEC sources of supply—a more developed relationship in the case of Romania, but also comparatively recent—was brought to a sudden halt by the political events in the Middle East of 1979-80 and their economic aftermath. By the end of 1981, regional imports of OPEC oil had been cut to about two-thirds their 1979 volume. The single exception was the GDR, whose profitable market for refined oil in West Berlin permitted it to continue to import OPEC crude at the new, higher prices. Beginning in 1982, however, several countries (notably Hungary and Poland, but apparently also Bulgaria and Czechoslovakia) began to import OPEC crude oil—especially from Libya—which they then reexported to hard-currency markets. While the terms of these imports are unclear, their resale appears to have made an important contribution to the improvement on current account in the hard-currency balance of payments of the East European CMEA countries in 1982-83. The East European state which is not a member of the CMEA—Yugoslavia—also suffered the adverse balance of payments effects of the 1979-80 OPEC price rise. Unlike all the CMEA countries except Romania, it does not enjoy access to Soviet oil at special, below-market prices. It does, however, receive this oil under a bilateral payments arrangement. Unlike

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Romania, it has relied in a more balanced fashion on imports both from OPEC and the USSR. Yugoslavia has cut its oil imports back sharply from their 1979 high, but in curtailing its OPEC imports more sharply, it has raised the Soviet share in its total oil imports.

## II. INTRODUCTION

This paper deals with Eastern Europe's trade in oil and gas with member-states of OPEC. Eastern Europe, in accordance with its definition throughout this volume, here comprises Yugoslavia as well as the six East European members of the CMEA. It will be convenient analytically to treat Yugoslavia in a section following our discussion of CMEA-OPEC relations. Even with our treatment of the CMEA-6, we shall deal separately with Romania, and refer to the remaining CMEA states collectively as the CMEA-5.

East European energy relations with OPEC are in fact concentrated with a sub-set of the member countries of that organization. The most important of these are Algeria, Iran, Iraq, and Libya.

Quantitative analysis of the subject is plagued by the paucity of reliable data. We have sought in the accompanying tables to limit the data presented to those which could be derived from official Eastern sources.[1] Estimates from other sources are added where relevant in the textual discussion. If the specific magnitudes must be treated with caution, the trends are nevertheless reasonably clear and well established.

## III. THE DEVELOPMENT OF CMEA-OPEC RELATIONS OVER THE 1970s[2]

The energy policies of the CMEA-5 had begun in the 1960s to stress the need to raise the share of the more efficient hydrocarbons in national energy balances. With an insufficient hydrocarbon resource base of their own, these countries had to import the oil and gas necessary to carry out the new strategy. For an overwhelming share of these imports, they turned to the Soviet Union. Oil imports from the USSR grew rapidly after the completion of the Friendship pipeline in the mid-1960's.[3]

As Eastern Europe's demand for oil rose, the region turned to OPEC suppliers as well. Significant growth of Eastern Europe's oil imports from several of the Arab OPEC countries and Iran began in the early 1970s. By 1979, combined imports of OPEC oil by the CMEA-5 constituted 12 percent of their total imports of crude oil. The two landlocked Comecon member-states, Czechoslovakia and Hungary, had meanwhile joined with Yugoslavia to construct a pipeline from the Adriatic to facilitate the import of oil from OPEC sources. Two OPEC members—Kuwait and Libya—assisted in the financing of the pipeline.

Romania's case was rather different. With important domestic resources to draw upon, it had based its postwar industrialization far more than had the other East European CMEA countries on oil and gas production and on petrochemicals. When demand began to outstrip supply, Romania also turned to external sources of oil, and in 1976 became a net importer. Unlike the other East European CMEA members, however, it chose not to import from the USSR, but to rely exclusively on OPEC sources. It did, however, join the other East European CMEA states in the joint construction of a pipeline for the import of Soviet gas, beginning in the late 1970s.[4]

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[1] See the "Note on Sources" in the Appendix for further details.

[2] The analysis in this section is developed and documented more fully in Hannigan and McMillan (1981a). See also Stern (1981).

[3] This and other aspects of the postwar evolution of Soviet-East European relations in oil and gas are treated in Hannigan and McMillan (1981b).

The growth of CMEA-6 imports of OPEC oil over the 1970s are shown in Table 1. From a level of 5.9 mmt (118,000 b/d) in 1970, imports of OPEC oil reached 24.7 mmt (494,000 b/d) in 1979. Their growth was not steady, however, and showed sensitivity to OPEC price increases. Thus there were cutbacks in most cases following the rapid rise in the OPEC price in 1973–74, which brought the cost of extra-regional imports of oil far above the cost of imported Soviet oil. After 1976, when the OPEC price had stabilized and had become relatively more attractive with the continuing rise in the Soviet price, growth of imports resumed.

TABLE 1.—EAST EUROPEAN IMPORTS OF OPEC CRUDE OIL 1970–82 (MMT)

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Bulgaria | 0.9 | •0.9 | •1.3 | •2.5 | •1.5 | •1.5 | •1.0 |
| CSSR | .4 | 1.3 | .9 | .7 | .8 | (–) | •1.0 |
| German Democratic Republic | 1.1 | 1.4 | 2.2 | 2.3 | 3.2 | 4.1 | •5.0 |
| Hungary | .4 | .9 | 1.5 | 2.1 | 9 | .5 | 1.8 |
| Poland | .8 | .4 | 1.9 | 3.2 | 3.1 | .4 | .3 |
| CMEA-5 | 3.6 | 4.9 | 7.8 | 10.8 | 9.5 | 6.5 | •9.1 |
| Romania | 2.3 | 8.8 | 12.9 | 13.9 | 14.5 | 10.2 | 9.4 |
| CMEA-6 | 5.9 | 13.7 | 20.7 | 24.7 | 24.0 | 16.7 | •18.5 |
| Yugoslavia | 2.8 | 5.5 | 6.3 | 7.2 | 6.0 | 4.4 | 4.1 |
| Eastern Europe | 8.7 | 19.2 | 27.0 | 31.9 | 30.0 | 21.0 | •22.6 |

(–) = Negligible or none
• = estimate

In what showed potential for developing into a more general East European trend, Czechoslovakia in 1976 entered into an agreement for the indirect import of Iranian gas. The agreement formed part of a larger gas-swap arrangement whereby the Soviet Union would import additional gas from Iran and would export increased amount of Soviet gas to Czechoslovakia and to several West European countries. Deliveries were to begin in 1981.[5]

The rise in oil imports from the OPEC countries was generally offset by a traditional trade surplus in favour of the CMEA countries. Comecon exports were comprised of capital goods and related services, military equipment and foodstuffs. The terms of payment of imported OPEC oil were generally soft, however, falling under bilateral clearing agreements or other barter-like arrangements. The latter would often link oil deliveries to East European provision of equipment and know-how for energy-development or other capital projects in the OPEC countries. Czechoslovakia's indirect imports of Iranian gas were in part to be repayment for use of the transit pipeline which Czechoslovakia was to construct in order to permit gas to be supplied to West European customers.

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[4] See Hannigan (1980).

[5] See Hannigan and McMillan (1982).

## IV. The Restructuring of Relations in the Early 1980s

Towards the end of the 1970s, it appeared that the East European countries would further extend their reliance on OPEC oil to meet incremental needs, as mounting constraints limited the expansion of Soviet deliveries. In fact, the Soviet Union announced to its CMEA partners at the 1980 Council Session that deliveries would not be increased over the then current level (the last year of the five-year plan periods).[6] The following year it let it be known that planned oil exports to Eastern Europe would in fact be cut below that level.[7] Meanwhile, East European analysts projected significant increases in extra-regional sourcing.[8]

Several developments intervened to thwart the continued growth of East European reliance on OPEC oil and gas, however. The revolution in Iran led to a termination of the gas swap agreement with the Soviet Union and precipitated events, including the Iran-Iraq war, which disrupted oil deliveries and resulted in another major jump in the OPEC price (an increase of almost 250 percent in 1979-80. In the initial phase of the second world energy crisis, the terms of payment which the East European Comecon countries faced also hardened. OPEC oil became unaffordable. Worst, and most immediately, affected, was Romania, the heaviest importer of OPEC oil among the CMEA-6 (see Table 1).

The Middle East events also affected the East European countries indirectly. The related Western recession curtailed the market for their exports at a time when the burden of the debt accumulated over the 1970s was bearing most heavily on their hard-currency balance of payments. Their terms of trade with the Soviet Union weakened further as the OPEC price set off another series of staggered increases in the price of Soviet oil under the CMEA's five-year moving average formula. Regional, political problems (the Polish events) and economic difficulties (declining productivity, poor harvests) also contributed to the economic crisis in Eastern Europe analyzed in other contributions to these volumes.

The East European countries, in these circumstances, belatedly reassessed economic strategies, including energy policies, for the 1981-85 period. Limiting oil imports, by substituting domestically-produced fuels and energy or through conservation measures, became the primary objective of energy policy throughout the region.[9] This had an immediate effect on imports from the OPEC countries. Table 1 shows that for most of the CMEA-5 (with the exception of the GDR for reasons to be discussed below), imports of OPEC oil were virtually eliminated by 1981, and Romanian imports had fallen sharply. In 1981, CMEA-6 imports of OPEC oil were 8 mmt (160,000 b/d) below their 1979 level. The Adria pipeline completed in 1979, remained unutilized by Czechoslovakia and Hungary.

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[6] Pravda, June 18, 1980, p. 4.

[7] The cuts were in the volume of planned deliveries at preferential CMEA prices. Not all countries were affected; the cuts were apparently limited to Czechoslovakia, the GDR and Hungary. Romania was not directly affected because its marginal purchases of Soviet oil after 1978 have been "above plan", at world market prices.

[8] Dobozi (1981).

[9] See Hannigan and McMillan (1983).

The OPEC option again became relatively more attractive in 1982–83, when oversupply on world markets brought a stabilization and then a fall in the OPEC price, narrowing the gap between the price of Soviet and OPEC oil. A number of East European countries increased their crude oil purchases from OPEC suppliers in 1982, a trend which appears to have continued through 1983.

East European imports of OPEC oil have continued to be financed by exports.[10] Industrial machinery and transportation and construction equipment, including arms, remain the dominant export category for the northern tier countries. Recent Middle East events have created a strong market for arms sales. Exports of foodstuffs have been more important in the OPEC trade of the Balkan CMEA countries and Hungary.

There has been some shift in the relative position of individual OPEC trading partners. The former importance of Iraq as a Comecon supplier has been reduced by the disruptive effect of the war with Iran on its ability to export. Libya, in turn, has risen in relative importance. After a temporary decline in deliveries due to the turmoil within the country, Iran has resumed its role as a major supplier.

The recent resumption of imports of OPEC oil by most of the CMEA–5 is for a substantially different purpose than the CMEA-OPEC oil trade of the 1970s. While formerly oil purchases were predominantly to fill domestic requirements, they are now largely for reexport, in both crude and processed form. As we shall see in the next section, these reexports have been dictated primarily by short-term balance of payments considerations, as the East European countries have sought desperately to reduce their hard-currency deficits on current account.

Table 2 shows that while the exports of crude oil and oil products by the CMEA–5 as a whole regained pre-1978 levels by 1981–82, those of the GDR had expanded significantly, and those of Hungary increased dramatically in 1982. There is preliminary evidence (see below) that the exports of the other CMEA–5, with the exemption of Czechoslovakia, have also followed this pattern in 1982. These exports have largely offset imports from the OPEC countries, as Table 3 demonstrates, so that net imports from outside the CMEA have not risen as a share of East European domestic consumption.

## V. CMEA Country Specifics

Because relations with OPEC vary significantly among the East European countries, we cannot push generalizations much further. Bearing the overall trends outlined above in mind, we shall now analyze developments after the 1979–80 turning point on a country-by-country basis. Before doing so, however, a short dicussion of the technical basis and apparent profitability of East European reexports of oil products is in order.

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[10] For details of Eastern Europe's exports to OPEC in recent years, see, "Comecon Trade With the Region", Middle East Review, 9th Edition, 1983, pp. 37–41.

East European exports of oil products, mostly of residual fuel oil and gas oil, result to a large extent from the disproportionately high percentage of residual and fuel oil produced from a barrel of crude. The oil refining processes in Eastern Europe are generally shallow, and yield a higher percentage of the heavy fractions than is the norm in Western countires. In order to meet domestic requirements for middle and light distillates (gasoline, kerosene, aromatics), relatively more crude oil is processed, and this results in a surplus of heavy oil products. These heavier products are then exported to hard-currency markets.

Catalytic converters, which use fuel oil as a feedstock and refine it into lighter fractions, would help to reduce East European requirements for crude oil. It might, at the same time, eliminate much of their surplus of oil products exportable to the West. Several of these countries have either built catalytic reforming units at their oil refineries, or are in the process of doing so. The GDR introduced a catalytic cracking unit in 1981, Bulgaria in 1982, and Hungary's Szazhalambotta oil refinery should have a catalytic converter unit in operation in 1984.[11]

In the early 1980s, balance of payments difficulties have motivated the East European countries to force exports of crude oil and oil products beyond normal levels, in order to generate hard-currency earnings. Success in substituting gas for oil may also have played a part in releasing oil products for export. One mmt of residual fuel oil or gas oil exports would generate approximately US $200 million on Western markets at 1983 prices.

It is questionable, however, whether the import of OPEC oil for processing and reexport to the West is profitable for most East European countries at current price levels. An exception in this regard is the GDR, which is able to use its refining capacity to supply oil products to West Berlin on a "cost-plus" basis.[12] It would appear that this was the factor which caused the GDR, alone among the CMEA-5, to increase its imports of OPEC oil in 1979-81, when the OPEC price was skyrocketing (Table 1). GDR exports of oil products on hard-currency markets rose roughly in step with its imports of OPEC oil (Table 2). As a result, the GDR was able to maintain the volume of its extra-regional trade in oil and oil products in approximate balance (Table 3).

TABLE 2.—EAST EUROPEAN EXPORTS OF CRUDE OIL AND OIL PRODUCTS, 1970–82 (MMT)[1]

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Bulgaria | NA | NA | NA | NA | NA | NA | NA |
| CSSR | 0.8 | 1.3 | 0.8 | 0.7 | 1.6 | 1.2 | [e] 1.0 |
| German Democratic Republic | 1.3 | 2.2 | 1.9 | 2.2 | 3.0 | 4.1 | [e] 4.0 |
| Hungary | 1.2 | 1.7 | 1.9 | 0.4 | 1.1 | 1.0 | [2] 2.6 |
| Poland | 1.3 | 2.2 | 1.9 | 1.5 | 1.6 | 0.8 | 0.6 |
| CMEA-5 (less Bulgaria) | 4.6 | 7.4 | 6.5 | 4.8 | 7.3 | 7.1 | [e] 8.2 |
| Romania | 5.1 | 6.7 | 7.6 | 6.9 | 7.0 | 7.4 | 5.9 |
| CMEA-6 (less Bulgaria) | 9.7 | 14.1 | 14.1 | 11.7 | 14.3 | 14.5 | [e] 14.1 |

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[11] "Tsel': Bolee glubokaya pererabotka nefti", Ekonomicheskoye Sotrudnichestvo Stranchlenov SEV, No. 7, 1983, p. 49.

[12] Petroleum Intelligence Weekly, November 7, 1983, p. 4.

TABLE 2.—EAST EUROPEAN EXPORTS OF CRUDE OIL AND OIL PRODUCTS, 1970–82 (MMT)[1]—Continued

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Yugoslavia | 0.3 | 1.0 | 0.9 | 0.8 | 0.6 | 0.5 | * 0.3 |
| Eastern Europe (less Bulgaria) | 10.0 | 15.1 | 15.0 | 12.5 | 14.9 | 15.0 | * 14.4 |

[1] Primarily of oil products unless otherwise noted.
[2] A large proportion (about 2 mmt) is crude oil.
NA = not available.
* = estimate.

TABLE 3.—NET EXPORTS OF OIL AND OIL PRODUCTS TO NON-CEMA COUNTRIES, 1970–82(MMT)[1]

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Bulgaria | NA | NA | NA | NA | NA | NA | NA |
| CSSR | 0.4 | (–) | –0.1 | (–) | 0.8 | 1.2 | (–) |
| German Democratic Republic | 0.2 | 0.8 | –0.3 | 0.1 | –0.2 | (–) | * –1.0 |
| Hungary | 0.8 | 0.8 | 0.4 | –1.7 | 0.2 | 0.5 | 0.8 |
| Poland | 0.5 | 1.8 | (–) | –1.7 | –1.5 | 0.4 | 0.3 |
| CMEA–5 (less Bulgaria) | 1.9 | 3.4 | (–) | –3.3 | –0.7 | 2.1 | * 0.1 |
| Romania | 2.8 | –2.1 | –5.3 | –7.0 | –7.5 | –2.8 | –3.5 |
| CMEA–6 (less Bulgaria) | 4.7 | 1.3 | –5.3 | –10.3 | –8.2 | –0.7 | * –3.4 |
| Yugoslavia | –2.5 | –4.5 | –5.2 | –6.4 | –5.4 | –3.9 | * –3.8 |
| Eastern Europe (less Bulgaria) | 2.2 | 3.2 | –10.5 | –16.7 | –13.6 | –4.6 | * –7.2 |

[1] A positive balance means more oil exports than imports of OPEC oil.
(–) = Negligible or none.
–1.2 = The country imported 1.2 mmt more oil from OPEC than it exported to all countries.
* = estimate.

The GDR is not alone among the CMEA–5's as an oil exporter. Table 2 indicates that Hungary, Poland and Czechoslovakia have also attempted to maintain oil products exports in the face of declining oil imports. Table 3 also reveals that for the most part, the extra-regional trade in oil of the CMEA–5 has remained in relatively close balance.

Through 1981, the oil exports of the East European CMEA countries were predominantly in the form of oil products. The principal exception appears to have been Bulgaria, whose exports are believed to have been mostly reexports of Soviet crude oil. We have not, however, been able to obtain data on the volume of Bulgarian reexports of crude oil, whether of Soviet or OPEC origin.[13]

In 1982–83, however, both Hungary and Poland reexported OPEC crude oil. The Hungarian foreign trade statistical yearbook provides enough information to show that Hungary must have reexported a significant volume of Libyan and Iranian crude oil in 1982. In the autumn of 1983, Poland announced that it had reexported Libyan crude. It is possible that, given the glut of oil on the world market, these OPEC suppliers were prepared to negotiate favourable terms for oil exports to CMEA clients (in their financing, if not in their nominal price), especially if they were connected to arms deliveries.

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[13] Wharton Econometric Forecasting Associates (WEFA) have reported Bulgaria to have reexported significant quantities of Soviet crude oil. They estimate Bulgarian crude oil exports to have averaged over 1.5 mmt (30,000 b/d) annually in the period 1979–82, presumably most of Soviet origin. See also Petroleum Intelligence Weekly, November 7, 1983, p. 4.

Hungarian imports of Iranian crude oil approximately doubled in 1982 to 1 mmt (20,000 b/d), and imports of Libyan crude were approximately 0.8 mmt (16,000 b/d). Hungary had not purchased any Libyan crude in 1981. In the case of Libya, oil deliveries in 1982 may have been related to the imbalanced trade between these two countries. Libya had been running substantial trade deficits with Hungary, in the order of 1,340 million forints (US $42 million) in 1980 and 2,880 million forints (US $82 million) in 1981.

Hungarian foreign trade statistics also indicate that as much as one-third of its imports of Libyan crude were made on the account of a third country, probably the Soviet Union. This oil may well have been received via a three-way barter arrangement, whereby the USSR took Libyan crude in return for sales of arms or capital goods, and then reexported it to Hungary to offset Hungarian sales to the USSR. Hungary has had a surplus of convertible currency trade with the USSR for several years.

Hungary's domestic production and total imports of crude oil amounted to 10.7 mmt (214,000 b/d) in 1982. Hungarian national accounts show that the country's total crude oil consumption in that year was 8.7 mmt (174,000 b/d). This leaves a residual of 2 mmt (40,000 b/d) which could be almost entirely accounted for by reexports of OPEC crude.

Another country of the CMEA-5 which has reexported OPEC oil is Poland. In October 1983, the Polish press reported that 500,000 tons (10,000 b/d) of crude oil had been imported from Iran and one mmt (20,000 b/d) from Libya.[14] The Libyan crude oil was reexported. According to a subsequent Western press report from Warsaw, Poland purchased the Libyan crude on credit, then sold it immediately on the world market for hard currency in order to import required raw materials.[15] The despatch concluded that Poland would incur a substantial loss in this transaction because of the weak spot market prices for crude, and that the transaction revealed Poland's desperate need for hard currency.

While this is possible, there are probably other factors involved. As with Hungary, Libya had accumulated significantly large trade deficits with Poland. In fact, in 1981-82, Poland registered no imports from Libya while Polish exports continued to increase. The 1983 deliveries of crude oil to Poland were no doubt related to the imbalanced trade, and even in partial repayment for previous Polish exports of goods and services. In these circumstances, Poland could well have received crude oil on favourable terms, making reexports profitable.

The Polish and Hungarian reexports of OPEC crude oil have added a new dimension to East Europe's relations with OPEC. While it is possible that the practice was not completely unknown before 1982, the magnitude of such reexports would have been small, certainly much smaller than the volumes recorded in the Polish and Hungarian cases.

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[14] Summary of World Broadcasts, Eastern Europe (EE/W1260/A/24), October 27, 1983, p. 24.

[15] New York Times, November 26, 1983, p. 6.

Crude oil reexports are hard to trace in the best of circumstances, but given the secrecy which cloaks the oil trade of most CMEA countries, it it unusually difficult. Bulgaria regards all its oil trade as too sensitive to report. Therefore, to single out Hungary and Poland as the two countries which have reexported OPEC crude, may simply be to reflect the greater amount of information made available by them. Some Western analysts believe that Bulgaria and, to a lesser degree, Czechoslovakia have also reexported crude oil received in payment for exports to OPEC partners.[16]

As it stands, reexports of OPEC crude oil by the CMEA-5 were probably around 2-3 mmt per year (40,000-60,000b/d) in 1982 and 1983. At prevailing spot market prices this would have generated additional hard currency revenue of approximately US $500-750 million in 1982 and US $425-625 million in 1983.

This activity is estimated to have restored total East European imports of OPEC oil from the low 1981 level. The CMEA-5's imports of OPEC oil in 1982 amounted to an estimated 9.1 mmt (182,000 b/d), an increase of 40 percent over the 1981 level of 6.5 mmt (130,000 b/d).

All of these countries have cut back on their apparent consumption of oil, either by austerity measures (Poland and Czechoslovakia)[17] or through conservation and fuel substitution (the GDR, Hungary, and to a lesser extent Bulgaria).[18] However, the associated reduction in imports was primarily of Soviet, rather than OPEC, oil. As a result the share of OPEC oil in total crude oil imports by the CMEA-5 increased in 1982-83.

Romania's imports of OPEC crude oil have been on a scale quantitatively different from the CMEA-5 countries'. In the 1977-81 period, Romania imported over 50 percent more crude oil than the CMEA-5. At the peak in 1980, Romanian imports of OPEC oil reached 14.5 mmt (290,000 b/d), compared to 9.5 mmt for the CMEA-5.

Until 1979, all of Romania's imports came from outside the CMEA, primarily from OPEC. Iran and Iraq were Romania's main OPEC suppliers. In 1979, Romania began to import Soviet crude oil, in hard currency and at world prices. These purchases of Soviet crude were increased in 1980 to 1.5 mmt (30,000 b/d), but remained less than 10 percent of Romania's oil imports.[19]

Romania's development of its oil refining industry underlies the evolving oil relationship with OPEC. This industry had been developed in part to pursue an export strategy. Refining domestically-produced crude oil and exporting the products to hard-currency markets served Romania well, as long as most of the crude oil being processed was of domestic origin and product prices remained strong enough to ensure a profit margin. In the early 1970's, however, Romanian oil production began to level off, and eventually peaked in the mid-1970's. In the meantime, domestic oil consumption continued to rise. Romania maintained its strategy of exporting oil products, however, so that imports of crude oil rose rapidly throughout the 1970's, from 2.3 mmt (46,000b/d) in 1970 to 16 mmt (32,000 b/d) in 1980.

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[16] WEFA Current Analysis, October 11, 1983.

[17] For specifics on the Polish case see Baczynski (1983).

[18] It has been estimated that the CMEA-5 cut back on their apparent consumption of oil in 1982 by 4.7 mmt (94,000 b/d), representing a six percent reduction from the 1981 level. See Hannigan and McMillan (1983), Appendix Tables.

[19] In 1981, they increased to 2.5 mmt (about 20 percent of imports) but in 1982, fell again to 1.5 mmt (almost 15 percent).

The events of 1979-80 hit Romania particularly hard. Not only did the price of oil escalate, but its two main suppliers were at war, hindering their capacity to deliver. Moreover, even though oil imports increased in 1979-80, Romanian oil exports actually declined slightly from the 1978 level (Table 2). As a result, net imports of oil increased as did the hard-currency deficit in Romania's oil trade. This was one of the factors contributing to the subsequent balance-of-payments crisis, and the need in 1982 for Romania to reschedule its hard-currency debts.

Thus, in comparison to the CMEA-5, Romania was less able to balance its hard-currency oil trade (see Table 3). Romania's dependence on OPEC oil for domestic consumption was much greater than for the CMEA-5 countries in the late 1970s, and it was not sheltered from the second oil shock by access to Soviet oil supplies at preferential, intra-CMEA prices. Romania's desire for independence from Soviet oil supply, while serving desired political purposes, proved costly in economic terms.

Romania had to reassess its strategy and adopt severe austerity measures in 1981 to restore balance in its external accounts. One of the main measures was sharply to reduce oil imports. Since 1980, Romanian imports of oil from OPEC have fallen by 35 percent, to 9.4 mmt (190,000 b/d) in 1982. At the same time, Romania has taken steps to reduce its refining capacity and to curtail its product exports, in an attempt to limit them to the most profitable (or least unprofitable) operations (see Table 2).

The cutbacks in oil imports have helped substantially in improving Romania's hard-currency balance of trade. From a deficit of $1.5 billion in 1980, Romania turned its hard-currency balance of trade around to a surplus position of $1.5 billion in 1982. This was accomplished primarily through a drastic reduction in total imports from hard-currency markets. Of the $3.4 billion decline in these imports between 1980 and 1982, as much as one-third may have been accounted for by lower oil imports. While helping its external balance, however, these cutbacks caused serious shortages of oil in the domestic economy.[20]

Given its continued weak financial position, Romania will be hardpressed to keep crude oil imports at the 1982 level. It is more likely that the volume will decline again in 1983. Oil barter deals remain one of the few alternatives in present circumstances. Romania has had some success in this respect. In April of 1983, Romania concluded a barter agreement with Iran for the import of one mmt during 1983 (20,000 b/d)).[21] Romania also succeeded in completing an oil barter deal with a non-OPEC supplier. A "tanks for oil" barter arrangement with Egypt, for an unspecified amount of oil, was concluded in the autumn of 1983.[22] Romania has, however, been unsuccessful in raising the volume of its imports from the USSR. Apparently, Romania has not reexported OPEC oil. Although the barter deal with Iran would provide Romania with the possibility of raising cash through the reexport of crude oil which it obtained on barter terms, there is no evidence that this practice was pursued.

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[20] Because of the deteriorating fuel supply situation, Romanian authorities initiated in November 1983, a program calling for drastic cutbacks (as much as 50 percent for households) in the consumption of energy. See reports in Scinteia during the month of December 1983.

[21] Summary of World Broadcasts, Eastern Europe, (EE/W1235/A/6), May 5, 1983, p. 6.

[22] East European Markets, November 28, 1983, p. 11.

## VI. YUGOSLAVIA

Next to Romania, Yugoslavia has been the largest East European importer of OPEC crude oil over the 1970-82 period. Imports of OPEC crude have come predominantly from Iraq, Iran, Libya and Algeria. At the 1979 peak, the volume of these imports—7.2 mmt (144,000 b/d)—was about 50 percent as large as Romanian imports (Table 1). Like most other East European countries, there has been a marked decline in these purchases since 1979.

Yugoslavia responded more quickly to the price increases of 1979-80 than most of the other CMEA countries (except for Hungary), reducing the volume of its imports of OPEC crude oil by 1.2 mmt (24,000 b/d) in 1980. Further cuts were recorded in 1981, lowering the total volume of OPEC crude oil imports to 4.4 mmt (88,000 b/d), almost 40 percent below the 1979 level (Table 1). A preliminary estimate for 1982 shows that Yugoslavia's imports of OPEC oil have remained at roughly the 1981 level.

Comparing the reduction in Yugoslavia's imports of OPEC oil with that of total oil imports (Table 4), it can be seen that OPEC oil has made up almost all of the decline. The major non-OPEC supplier to Yugoslavia—the USSR—has not reduced the level of its oil deliveries. When viewed against the reductions in Soviet oil exports to some of its CMEA partners, and considering that the USSR allows Yugoslavia soft payments arrangements for most, if not all, of its oil imports from the USSR, Yugoslavia appears to be, comparatively speaking, a favoured recipient of Soviet oil, even though not a full member of the CMEA.[23] In 1980, the Soviet Union replaced Iraq as the largest supplier of oil to Yugoslavia.

TABLE 4.—TOTAL EAST EUROPEAN IMPORTS OF CRUDE OIL AND OIL PRODUCTS, 1970–82 (MMT)

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Bulgaria | 7.9 | 14.1 | 15.0 | 15.9 | 16.5 | 16.5 | • 15.3 |
| CSSR | 10.9 | 19.5 | 19.7 | 19.8 | 20.2 | 19.4 | • 18.0 |
| German Democratic Republic | 10.4 | 19.2 | 20.1 | 20.9 | 22.3 | 23.1 | • 22.1 |
| Hungary | 5.3 | 10.0 | 12.0 | 11.6 | 10.2 | 9.3 | 10.0 |
| Poland | 9.4 | 19.7 | 20.0 | 20.5 | 20.8 | 17.4 | 16.4 |
| CMEA–5 | 43.9 | 82.5 | 86.8 | 88.7 | 90.0 | 85.7 | • 81.8 |
| Romania | 2.3 | 8.8 | 12.9 | 14.3 | 16.0 | 12.7 | 10.9 |
| CMEA–6 | 46.2 | 91.3 | 99.7 | 103.0 | 106.0 | 98.4 | • 92.7 |
| Yugoslavia | 5.5 | 10.9 | 12.0 | 13.2 | 12.1 | 10.5 | 9.8 |

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[23] Yugoslavia receives Soviet oil (and gas) under the terms of a bilateral trade agreement with the USSR. This is similar to the payments arrangements for planned deliveries which the USSR has with the CMEA-5, but different from Romania, which pays in hard currency for its Soviet oil. See Politika (Belgrade), March 25, 1983, p. 9, as reported in FBIS, Eastern Europe Reports, March 29, 1983 p. 18.

TABLE 4.—TOTAL EAST EUROPEAN IMPORTS OF CRUDE OIL AND OIL PRODUCTS, 1970–82 (MMT)—Continued

| | 1970 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| Eastern Europe | 51.7 | 102.2 | 111.7 | 116.2 | 118.1 | 108.9 | * 102.5 |

* = estimate.

In contrast to Romania, Yugoslavia has relied upon the Soviet Union for a larger portion of its total oil imports. This share has in fact been increasing in recent years, given the maintenance of Soviet supplies (including oil products) at over 5 mmt per annum (100,000 b/d) and the reduction in OPEC crude oil imports. In 1981 and 1982, Soviet oil accounted for more than 50 percent of total oil imports, compared to approximately 40 percent in 1979.

The Soviet role may have become even more important in 1983. In March of that year, reports in the Yugoslav press indicated that in 1983 there was an "opportunity" for Yugoslavia to import one mmt (20,000 b/d) of crude oil over the already agreed 4.5 mmt (90,000 b/d).[24] (The terms of payment for these extra deliveries are not precisely known.) Imports of oil from the USSR were apparently 20 percent higher than planned in the first two months of 1983, resulting in fewer purchases from OPEC.[25]

While Yugoslavia has managed to retain oil supplies in the bilateral trade agreement with the USSR, it has also been able to strike barter deals with certain OPEC suppliers. A December 1, 1982 barter agreement with Iran insured the supply of one mmt (20,000 b/d) of Iranian crude for Yugoslavia in 1983, with a possibility that the volume be raised to 1.5 mmt (30,000 b/d).[26] Thus, Yugoslavia is currently not having to spend scarce foreign exchange for at least 60 percent of its oil imports.

Most of the oil imported by Yugoslavia is to meet domestic demand; only a small amount of oil products is exported. In any given year in the 1970–82 period Yugoslavia has generally exported fewer oil products than any of the other East European countries (Table 2). As a result, the deficit in the volume of its hard-currency oil trade has been relatively large (Table 3), substantially more than any of the CMEA-5 countries.

While the level of Yugoslavia's oil exports has generally been low, and entirely made up of oil products, there were some exceptional circumstances in 1983 which may have led to a higher level of oil, including crude, exports. In the summer of 1983, the major Yugoslav oil company—INA of Zagreb—was granted permission by Yugoslavia's Federal Executive Council to export 500,000 tons (10,000 b/d) of crude oil and 226,000 tons (4,500 b/d) of oil products in order that the company could repay $185.5 million of outstanding debt.[27] This is possibly the first time that Yugoslavia has exported crude oil, made all the more extraordinary because it comes at a time of acute domestic shortages. In all likelihood, it was domestically-produced crude offered for export, not the reexport of OPEC crude.

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[24] Ibid., p. 18.

[25] Ibid., p. 19.

[26] FBIS, Eastern Europe Daily Reports, December 2, 1982, p. 12, reporting a broadcast of Tanjug.

[27] JPRS, Eastern Europe: Economic and Industrial Affairs, No. 84107, August 12, 1983, p. 70, reporting a Tanjug broadcast of July 25, 1983; and Borba (Belgrade), August 9, 1983, p. 3, reported in FBIS, Eastern Europe Daily Reports, August 16, 1983, p. 15.

For the first six months of 1983, crude oil imports had fallen behind the anticipated level by 1.4 mmt (28,000 b/d).[28] As Soviet oil deliveries were above target during the first quarter of 1983, the shortfall had to be in purchases of OPEC oil. Consequently, we estimate that Yugoslav imports of crude oil from OPEC will be less in 1983 than 1982, perhaps around 4 mmt (80,000 b/d). Accordingly, OPEC's share of total oil imports by Yugoslavia could in 1983 drop to below 40 percent (from 55 percent in 1979). There is little likelihood of increased imports in the near term given the current weak financial position of Yugoslavia.

## VII. Significance and Prospects

The growth of OPEC oil by the East European countries over the 1970s was significant in several respects beyond the intrinsic importance of the trade itself. For the CMEA-5 it represented a diversification of their sourcing of a key raw material and a consequent reduction of their dependence on Soviet supplies. For the East European countries as a whole it meant a new economic basis for their relations with strategic countries of the Middle East and North Africa. At the same time, it posed Eastern Europe as a growing claimant on the sources of supply on which the West was heavily reliant.

Events of the turn of the decade put a halt to these trends. The rapid rise in the price of imported oil combined with other pressures on their balance of payments to force most East European countries to curtail their oil imports from the OPEC countries after 1980. These cuts were accompanied as well, in most cases, by reductions in the volume of imported Soviet oil.

The revival of the oil trade of the CMEA-5 and certain OPEC countries in 1982-83 is not a return to the relationship of the 1970s. Rather than filling East European domestic needs, it primarily serves an international financial function: oil imports are a means of reducing trade surpluses with OPEC partners, while their reexport generates hard currency earnings to reduce CMEA deficits with the West. The attractiveness of this reexport trade appears to hinge more on the payments terms on which the CMEA countries are able to obtain OPEC crude than on direct price concessions. The trade pattern is thus dictated by special circumstances, in particular the severe hard-currency balance of payments difficulties faced by most of the CMEA countries. It is therefore likely to be temporary.

Two East European countries—Romania and Yugoslavia—stand apart in terms of their greater reliance on OPEC oil and hence in their exposure to the adverse effects of the 1979-80 oil price shock. Both in these circumstances have sought to increase the share of their imports from the USSR, while cutting back sharply on total imports. Paradoxically Yugoslavia—not a member of the CMEA—remains less dependent on OPEC sources and more reliant on Soviet oil than is Romania.

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[28] Borba (Belgrade), August 9, 1983, p. 3 reported in FBIS, Eastern Europe Daily Reports, August 16, 1983, p. 14.

Will there be a return to the CMEA-OPEC oil trade relationship of the 1970s? Current CMEA pricing arrangements and likely OPEC price trends suggest that the CMEA price will reach the OPEC level by 1985 and will rise above it thereafter. Once Eastern Europe's economy stabilizes, it may again seek to diversify its oil imports. At the same time, current East European energy policies, aimed at reducing the share of oil in domestic consumption, suggest that any such diversification will be at a lower level of imports.

The prospect for East European imports of Middle East gas, which had only begun to emerge in the 1970s, and on an indirect basis, seems less likely. The growth in the 1980s of Soviet gas production and the expansion of pipeline capacity for westward deliveries should eliminate recourse to extra-CMEA sourcing for the medium term at least. There have been talks of a pipeline to bring Iranian gas to Europe across Turkey, into which the Balkan countries might then be tied. The discussions remain preliminary, however, and the prospect remote.

## Appendix.—Note on Sources

We have relied as much as possible upon official statistical yearbooks, either national or international, for our data. Hungary, Poland and Yugoslavia are the only East European countries which report the volume of imports of oil by country. They also provide data on the volume of oil exports. For the other countries, except for Bulgaria, we have estimated the volume of oil imports from OPEC by taking total oil imports, as recorded in the CMEA's statistical yearbook, and subtracting the estimated volume of Soviet oil exports to these countries. Exports of oil products are given in the CMEA's statistical yearbook, except in the case of Bulgaria. We have found no primary source giving data on Bulgarian oil imports and exports. For Romania, we have also relied upon data provided by Romanian authorities to Western banks and governments during the negotiations on debt rescheduling. No statistics are provided by OPEC on the volume of oil trade with East European countries.

The following sources were used: Statisticheskii Ezhegodnik Stran-Chlenov SEV (Moscow); Rocznik Statystyczny Handlu Zagranicznego (Warsaw); Statistics of Foreign Trade of the SFR Yugoslavia (Belgrade); Kulkereskedelmi Statisztikai Evkonyv (Budapest); and OECD, Statistics of Foreign Trade, Series C, Trade by commodities.

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# III. AGRICULTURE

## OVERVIEW

By John P. Hardt and Donna L. Gold*

The natural conditions—weather and soil—in Northeastern and Southern Europe provide the bases for substantial improvement in agricultural performance. The modernization of agricultural facilities in line with Western farms and the adoption of incentive systems are the keys to increased output of grain, meat, and other quality products. Selective imports, especially of agricultural technology and feedgrain, as well as the introduction of New Economic Mechanisms (NEMs) in agriculture, appear to be central to regaining and expanding an agricultural export capability and improving domestic diets in Eastern and Southern Europe.

The authors in this section have addressed a number of questions, in particular:

> Can the East and South European countries improve the quality and quantity of food and agricultural products by changes in their agricultural systems, additional investment, and increased Western imports? Will likely agricultural production be sufficient to provide necessary material incentives and popular satisfaction? Is "agriculture first" a good economic strategy for the CMEA-Six** and Yugoslavia?

Some would argue that an agriculturally-driven growth priority would be merited on grounds of comparative advantage and economic requirements in most of the CMEA-Six countries and Yugoslavia. If valid, an "agriculture first" strategy for Poland, Hungary, Romania, Bulgaria and Yugoslavia would be more logical than for either of the industrial economies of the GDR or Czechoslovakia.

Since the mid-sixties, East European agricultural performance has been uneven.[1] Output in the 1971–75 period increased at an average rate of 3.9 percent for the whole region, or more than double the rate for the previous five years. In Hungary and Romania output grew most rapidly, followed by Poland, Yugoslavia, the GDR, Czechoslovakia, and Bulgaria. During the next five-year period (1976–80), growth slowed, and output grew at an average annual rate of only 1.6 percent for the whole region. In 1981 output actually decreased by 2 percent and in 1982 it rose by only 0.7 percent. In 1982, Bulgaria, Hungary, Romania, and Yugoslavia experienced the most improvement in agricultural performance, while in

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**The Council for Mutual Economic Assistance (CMEA) or COMECON. The CMEA-Six consists of: Bulgaria, Czechoslovakia, East Germany (GDR), Hungary, Poland, and Romania.

[1] This discussion is drawn from Gregor Lazarcik "Comparative Growth of Agricultural Output, Inputs, and Productivity in Eastern Europe, 1965–1982," and Karl Waedekin, "East European Agricultural Trends and Prospects: A European Perspective."

Czechoslovakia, the GDR, and Poland there were declines in output of 1.3, 4.6 and 5.0 percent, respectively. This was Poland's worst performance since 1975.

East European agricultural output declined in the 1970s relative to that of the United States and Western Europe. While Eastern Europe and the Soviet Union cannot supply their people with adequate food supplies, the United States not only produces enough to meet domestic needs at a high level of nutrition but also produces a surplus for export. Defining "self-sufficiency" as 80 percent of the U.S. level of per capita output as Gregor Lazarcik does, all of the countries of Eastern Europe as well as the Soviet Union are below "self-sufficiency."

Eastern Europe produced about 66 percent as much agricultural output per capita as the United States from 1971 to 1980. This level fell to 60 percent of that of the U.S. during the next two years, primarily due to poor weather conditions and reduced feed imports. Still, when compared to the U.S.S.R., whose performance fell from 63 to 51 percent of U.S. per capita output in the 1971-82 period, Eastern Europe performed better.

Karl Waedekin discusses another indicator of agricultural self-sufficiency: the increase of end-use output—the measure of how well domestic demands are met. Although this growth rate averaged from 1.0 to 3.2 percent per annum during 1970-80, domestic needs were not met without imports. Excess food demand (lack of self-sufficiency), however, does not suggest malnutrition but rather changes in quality of diet. Industrialization, urbanization, rising non-agricultural labor incomes all influence eating habits. Although the countries of Eastern Europe, except the GDR, should all provide for their own food, feed and meat needs based on their natural endowments, only Hungary and Bulgaria currently meet their domestic needs.

A continued, rapid increase in agricultural production is necessary throughout Eastern Europe—even in Hungary and Bulgaria—in order to keep pace with expected growth in domestic demand and to reduce reliance on imported feed, which is paid for almost entirely in hard (convertible) currency. The pressure to increase agricultural output to meet domestic needs without expensive imports is greatest in Czechoslovakia, GDR, Romania and Poland. Paradoxically, all East European countries had become net exporters of meat by the end of the 1970s, presumably to earn needed hard currency, certainly not because of fulfilled domestic demand for meat.

In terms of population and arable land, the northern and southern country groups of Eastern Europe are about equal: in 1982 Poland, the GDR and Czechoslovakia together had 68 million inhabitants and 24.4 million hectares of arable land, while Yugoslavia, Bulgaria, Hungary and Romania had 65 and 26 million, respectively. For 1965-80, the average annual rate of growth of output of animal products per unit of land exceeded that of output of crops for all the countries of Eastern Europe except Hungary for 1970-75 and the GDR for 1975-80.

The three countries of the North are likely to continue to import major quantities of feedstuffs and export limited quantities of animal products in the near term. Poland is an exception: although having the potential for self-sufficiency in food and for large net exports of animal products, the country's severe socio-economic conditions will prevent it from reaching such a position during the 1980s.

Southeastern Europe, less densely populated and still predominantly agrarian, is more likely to become a major net exporter of animal products and grain, along with exports of vegetables, fruit, wine and tobacco. Hungary and Bulgaria have already started to take advantage of their export potential. Romania and Yugoslavia may become permanent net exporters towards the end of the 80s. Their past rates of absolute growth in agricultural output combined with their still available labor reserves suggest such a possibility. As a whole, the growth rate for Southeast European agricultural output may reach 2–3 percent, which together with declining population growth should allow for an improved foreign trade balance in food. But this increase in exports would not be of such magnitude as to influence materially world markets.

All the countries of Eastern Europe will continue, and possibly increase, their imports of oilseeds and other high protein feedstuffs.

Less than one-fourth of the total labor force in Eastern Europe is employed in agriculture; it produces approximately one-fifth of total GNP. Agriculture as measured by its contribution to total GNP ranks below industry in every East European country. "Compared with the United States, the relative importance of agriculture is 7 to 8 times larger in Eastern Europe as a percentage of total labor force and GNP, respectively."

The ratio of agricultural land per person employed in agriculture is very small throughout Eastern Europe when compared to the American standard. Since 1975, however, this proportion has increased due to the continuous drop in employment in the agricultural sector. By 1982, the average number of hectares per person employed in agriculture was 5.2 for all of Eastern Europe, with Poland at 4.4 and the GDR at 7.5. Differences in non-agricultural inputs per hectare have been even larger among the East European countries. The levels for Czechoslovakia and the GDR were more than 5 times that of Yugoslavia in 1980–82. The use of non-agricultural inputs per unit of land in the more advanced countries was far greater than in the less advanced countries.

In Eastern Europe, unlike in the West, capital inputs per rural worker are less than those for the entire work force. Moreover, agricultural investment is not used as productively as in the West. Although combined non-labor inputs grew very rapidly for most countries from 1965 through 1975, there was little-to-no improvement in factor productivity from 1976–1982, inclusive of the last eight years. Lagarcik attributes this primarily to:

> A slowdown in the application of new technology on farms, a sharp decrease in imports of feed and other inputs due to hard currency foreign exchange shortages, increases in the cost of fuel and other inputs, and a certain degree of recentralization in management and a consequent decrease in personal incentives to farmers. . . . The adverse weather conditions in most East European countries during the last several years also contributed negatively to factor productivity.

The shortage of labor is an often cited problem for Eastern Europe. But, if Eastern and Western labor/land ratios are compared and the large scale of collectivized agriculture is considered, socialized agriculture appears to be overmanned. Excess use of labor may be related to available capital (horsepower or machine hours per man hour expended) and the overall efficiency of factor use. Incentives as distinguished from formal wages are important in increasing labor productivity, especially in East European livestock raising. For crop farming, labor shortages restrict performance at critical times, e.g., harvest. Migration from farm to city and an aging labor force have posed serious demographic and economic problems in Romania and on the hill farms in the Slovene Republic of Yugoslavia. By international comparison, however, migration away from the farm has been rapid only in Bulgaria, Romania and, up to the early 1970s, in the GDR.

Improvement in performance per unit of labor has been significant. Lazarcik maintains that: "It reflects largely the reduction of extensive, disguised agricultural unemployment by transfers of labor to non-agricultural sectors of the economy, permitting better overall use of available labor resources." Furthermore, he stresses that: "Progress in mechanization has continued to gain momentum. In most East European countries, the rates of increase were high; in fact, the percentage increases exceeded those of Western Europe."

Currently, rural/urban migration is experiencing a slowdown throughout Eastern Europe, and is keeping pace in Yugoslavia. As a result, capital and its effectiveness are critical for achieving required levels of output growth. New economic mechanisms (NEM)—so-called reforms—have become more important to enhanced agricultural performance as it becomes evident that resource allocation alone will not assure needed growth. Leaders throughout the region have been considering and unevenly implementing organizational and administrative changes to correct inefficiencies in production, and offering more incentives to stimulate performance by workers as well as managers.

Waedekin notes that changes in agricultural management mechanisms have become more flexible, and vary according to country:

> Less emphasis is now being placed on the so-called agro-industrial complexes and enterprises, i.e., on premature agribusiness, socialist style. Central planning and its mandatory fulfillment requirements has been made less exacting and rigid. All governments have accorded greater weight to price-oriented instead of command-oriented production and, except in the GDR, consumer food prices are no longer stable, so as to diminish the huge food price subsidies in the state budget. In the processing and marketing sphere, including storage, a comprehensive program on the management of the food economy is being set up to achieve greater flexibility and efficiency in meeting rising consumer aspirations. More attention is being paid—though still not enough—to investment devoted to rural infrastructure outside of the production sphere, i.e., supplies of consumer goods and communal services and the sociocultural development of the countryside.

According to Lazarcik East European governments have taken the following specific measures in response to the growing demand for high protein foods of animal origin:

> (1) Expanding production of high yield varieties of feed grains and concentrates, (2) increasing imports of feed, (3) allocating higher inputs into agriculture, particularly fertilizers, machinery and equipment, improved feeding technology, higher yield livestock breeds, and advanced agricultural technology, (4) decentralizing organization and management of farm production units, and, most important. (5) increasing incentives to farmers in the form of higher prices for farm products, stimulation of personal motivation through higher profits, greater participation of farm

workers in management of farms, major increases in fringe benefits, and recent provisions to encourage output and productivity on farmers' private plots.

Improved breeds of livestock have resulted in increased yields of milk per cow, eggs per hen, higher dressing rates of livestock, leaner types of animals, and higher daily gains in live weight for all livestock. The countries of Eastern Europe, Hungary and Yugoslavia in particular, are now looking to Western Europe and the U.S. for new breeds of livestock.

A less restrictive view towards the private sector has also been widely adopted in Eastern and Southern Europe as part of the efforts to accelerate production in agriculture. Only in Hungary, however, has private production and marketing been put on an equal footing with the public sector. Hungarian agricultural performance has been superior to that of the other East European countries, whether collectivized or not. Although Hungary's economic policy, NEM, represents a set of complementary measures adding up to reform within a centrally-planned economy, it appears tailor-made for Hungary and not necessarily transferable to the other countries of Eastern or Southern Europe.

# COMPARATIVE GROWTH OF AGRICULTURAL OUTPUT, INPUTS, AND PRODUCTIVITY IN EASTERN EUROPE, 1965-82

By Gregor Lazarcik*

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## SUMMARY

Agriculture, as measured by its contribution to total GNP, ranks second to industry in every East European country.

In view of the rapidly rising demand for high protein foods of animal origin, the East European governments have taken the following important measures to promote efficiency and rapid growth, especially of livestock production: (1) expanding production of high yield varieties of feed grains and concentrates, (2) increasing imports of feed, (3) allocating higher inputs into agriculture, particularly fertilizers, machinery and equipment, improved feeding technology, higher yield livestock breeds, and advanced agricultural technology, (4) decentralizing organization and management of farm production units, and, most important, (5) increasing incentives to farmers in the form of higher prices for farm products, stimulation of personal motivation through higher profits, greater participation of farm workers in management of farms, major increases in fringe benefits, and recent provisions to encourage output and productivity on farmers' private plots.

During the last eighteen years, comparative agricultural performance has been uneven among the East European countries, and within particular countries, over different sub-periods. In the 1965–70 period, agricultural output as measured in this study (defined as the supply of products for direct consumption in kind by producers and for sales of the farm sector) grew at a slow annual rate of about 1.7 percent for the whole region; in the 1971–75

period, the rate rose to 3.9 percent, or about double that of the preceding period. In the 1976–80 period, there was a substantial slowdown to an average annual rate of 1.6 percent, and in 1981–82, there was a negative −0.7 percent annual rate of growth. In response to rapidly growing domestic demand for animal products, their output during the 1965–80 period grew twice as fast as that of crops. During 1975–82, the growth of output was highest in Yugoslavia, Hungary, Romania, and Bulgaria, followed in descending order by Czechoslovakia, the German Democratic Republic, and Poland, where it actually decreased by 15 percent.

The combined factor productivity between 1965 and 1974 increased in all countries except Poland. Subsequently, however, from 1974 to 1982, it rose only in Yugoslavia while in the other countries it was either stagnant (Bulgaria and Hungary) or declined (Czechoslovakia, the GDR, and Poland), with no progress for Eastern Europe as a whole.

An international comparison of agricultural outputs in the 1980–82 period shows Eastern Europe at about 34 percent of the level of the USA. In terms of per capita level of agricultural output, a measure of self-sufficiency, the USA ranks by far the highest, followed in descending order by Hungary, Bulgaria, the German Democratic Republic, Romania, Czechoslovakia, Yugoslavia, the USSR, Western Europe, and Poland.

The future performance of East European agriculture will depend largely on personal incentives to farmers to use increased productive resources more rationally.

## I. INTRODUCTION

In the last eighteen years, the agricultural sectors in most East European countries have made tangible though uneven progress. This has taken place in the context of varying systems of management. In Poland and Yugoslavia, the ownership and management of farms continues overwhelmingly in private hands; less than one-fourth of agricultural land in each country is in state and collective farms. In Hungary, the "New Economic Policy", put into effect in agriculture after the 1961-62 collectivization, has provided a series of incentives to collective and individual farmers, and to a significant degree there has also been a decentralization of management of collective farms. Bulgaria, the GDR, Czechoslovakia, and Romania still generally operate under tightly centralized economic systems, with, however, a part of activity in private sectors. All the East European countries, in recent years, have implemented policies intended to encourage better use of resources and to improve agricultural productivity, and most have explicitly announced incentives to farmers' personal plots and private farms to increase output.

In the following pages, the recent agricultural performance of Eastern Europe will be analyzed by country and for the area as a whole. Some comparisons will also be made with the USSR, the Federal Republic of Germany, and the United States, in an attempt better to appraise the performance of recent years.

The aim of this basically statistical study is to present independently calculated measures and assess the changes in agricultural development in the East European countries in recent years. Aspects to be covered are: (1) changes in the relative importance of agriculture in the national economy of each country, (2) changes in the growth and structure of basic output and input measures, (3) trends and levels of output per capita, (4) changes in productivity of land and labor in agriculture (5) progress in agricultural technology and growth of investment, (6) changes in combined factor productivity, (7) comparisons of output between Eastern Europe, Western Europe, the USSR, and the USA, and (8) concluding remarks.

It should be noted that agricultural measures developed here may differ somewhat from those of Thad P. Alton in this volume because of different concepts and valuation. Our indexes here are based on 1978 US dollars, while the agricultural GNP measures used in Alton's study are based on domestic prices of the respective East European countries. The quality of basic primary data used in our calculations is considered best for Hungary, Czechoslovakia, the GDR, fairly good for Poland, Yugoslavia, and Bulgaria, and worst for Romania.

## II. Agriculture's Role in East European Economies

Until the mid-1960s, agriculture, measured in terms of its share in total employment and its share in the gross national product, was the largest economic sector in several of the East European countries. Both its employment and GNP shares, however, have been declining steadily in all countries during the whole postwar period, with rapid industrialization (see Table 1). By 1982, in all the East European countries the share of agricultural labor had declined to below one-third of the total. In Czechoslovakia, only 12.9 percent and in the GDR, 10.0 percent of total employment remains in agriculture. The share of agriculture's contribution to the total GNP also decreased substantially in all countries. It is interesting to note that in 1982 the GNP share of agriculture was larger than that of employnent in the total for Czechoslovakia, the GDR, and Hungary. This suggests that the farmers' incomes in these countries are higher than in non-agricultural employment.[1] Eastern Europe as a whole has a little less than one-fourth of its labor force in agriculture and generates about one-fifth of GNP in agriculture. Compared with the USA, the relative importance of agriculture is 7 to 8 times larger in Eastern Europe as a percentage of total labor and GNP, respectively.

TABLE 1.—AGRICULTURE'S SHARE IN PERCENT OF TOTAL LABOR FORCE AND GNP

| | Labor force | | GNP | |
|---|---|---|---|---|
| | 1965 | 1982 [1] | 1965 | 1982 [1] |
| Bulgaria | 44.9 | 22.7 | 35.2 | 22.6 |
| Czechoslovakia | 19.5 | 12.9 | 17.6 | 13.4 |
| German Democratic Republic | 14.0 | 10.0 | 15.6 | 11.8 |
| Hungary | 27.2 | 19.9 | 25.2 | 24.9 |
| Poland | 38.1 | 29.8 | 29.0 | 26.6 |

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[1] In Czechoslovakia, for example, the average agricultural labor income was 4 percent higher than the average nonagricultural labor income in 1981. (Calculated from Statisticka rocenka 1982, pp. 202, 210, 213, 537.)

TABLE 1.—AGRICULTURE'S SHARE IN PERCENT OF TOTAL LABOR FORCE AND GNP—Continued

| | Labor force | | GNP | |
|---|---|---|---|---|
| | 1965 | 1982 [1] | 1965 | 1982 [1] |
| Romania | 57.4 | 28.3 | 41.4 | 26.4 |
| Yugoslavia | 49.7 | 33.7 | 25.5 | 19.5 |
| Eastern Europe | 37.2 | 23.0 | 25.3 | 19.8 |
| U.S.A. | 6.9 | 3.1 | 3.5 | 2.6 |

[1] Preliminary.

Sources: Eastern European countries. Labor force: Agricultural employment is in terms of yearly averages of mid-year data of econonimcally active persons in agriculture taken from statistical yearbooks of the respective countries. GNP: Calculated from Thad P. Alton, present volume. The shares were adjusted for forestry. Some data for 1982 were estimated from 1981 and the plan fulfillment reports for 1982 reported by the statistical offices of the respective countries. United States: "Statistical Abstract of the United States, 1976," U.S. Department of Commerce, 1976, pp. 356, 365, and 395, and "Survey of Current Business," 1983, No. 8, pp. 4 and S-9.

## III. RECENT GROWTH AND STRUCTURE OF OUTPUT AND INPUTS

The various measures of output and expenses for Eastern Europe as a whole and for individual countries for the 1965–82 period [2] are given in Tables 2 and 3. All measures in this study are independent estimates comparable with Western agricultural measures. For concepts and definitions of these measures, see Appendix B.[3]

Official country statistics publish on a regular basis measures of gross agricultural production which include all intermediate products used on farms to further production.[4] Our agricultural output measures are independently calculated and they exclude this double count of intermediate products. In Appendix C we present a comparison of the official gross agricultural production and our calculated agricultural output indexes for selected years. The two measures do not differ greatly. The official gross production indexes tend to grow faster for Bulgaria, Poland, and Romania, while for Czechoslovakia, the GDR, and Hungary they are close to our calculated output indexes. For Yugoslavia, however, the official gross production grows at a slower rate than our output. These differences suggest differing compositions of intermediate products and other inputs from country to country. It should be kept in mind that the content of these two measures is different, and hence they are not strictly comparable.

### A. PERFORMANCE IN INDIVIDUAL COUNTRIES

From 1975 to 1982, the greatest increase in agricultural output was achieved by Yugoslavia with an increase of 25 percent, followed by Hungary and Romania with an 18 percent rise each (Table 2). Bulgaria, Czechoslovakia, and the GDR achieved increases of 17, 7, and 4 percent, respectively, for the same period, while Poland experienced a 15 percent decrease in output. During the period 1965–80, the output of animal products grew at a higher annual rate than output of crops in all countries except Yugoslavia for 1965-70, Hungary for 1970-75, and the GDR for 1975-80. However, in the 1970-75 period the output of animal products grew faster than in 1975-80 in all countries. In the 1970s, all the East European countries have put heavy emphasis on rapid increases in meat, eggs, and milk output in order to improve the quality of national diets. In 1981 and 1982, however, the animal output decreased sharply in the region as a whole due to increased import of feed; Bulgaria, Yugoslavia, and Hungary were exceptions.

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[2] Measures of performances for earlier postwar years are given in G. Lazarcik, Compendium 1974, pp. 328–329, and ibid., pp. 594–595.

[3] All average annual rates of growth in this study are calculated as the rates given by a least squares fit of growth equation $I_n = I_0 (I + r)^n$ to the indexes.

[4] Poland is the only country in Eastern Europe that computes agricultural output measures (produckcia koncowa and produkcia towarowa: the former includes the latter plus consumption in kind of their own production by farmers).

## TABLE 2.—GROWTH OF AGRICULTURAL OUTPUT

| | Indexes, 1975 = 100 | | | | | | | | | | Average annual rate of growth [2] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 [1] | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 [1] |
| Bulgaria: | | | | | | | | | | | | | | | |
| Output | 82.6 | 90.6 | 100.0 | 103.8 | 97.6 | 103.7 | 109.4 | 105.9 | 111.8 | 116.9 | 1.1 | 1.7 | 1.4 | 5.6 | 4.6 |
| Crops | 96.3 | 101.9 | 100.0 | 107.2 | 92.3 | 99.9 | 103.1 | 96.8 | 104.5 | 111.2 | .1 | −.4 | −.6 | 8.0 | 6.4 |
| Animal products | 69.5 | 79.8 | 100.0 | 100.5 | 102.8 | 107.3 | 115.4 | 114.6 | 118.9 | 122.5 | 2.4 | 4.0 | 3.3 | 3.7 | 3.0 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| Output | 73.1 | 87.6 | 100.0 | 98.0 | 105.0 | 106.5 | 104.8 | 109.6 | 108.4 | 107.0 | 3.1 | 3.1 | 1.9 | −1.1 | −1.3 |
| Crops | 78.3 | 92.9 | 100.0 | 89.5 | 105.8 | 104.1 | 97.1 | 102.5 | 100.0 | 108.9 | 1.9 | 2.6 | 1.0 | −2.4 | 8.9 |
| Animal products | 71.4 | 85.9 | 100.0 | 100.8 | 104.8 | 107.3 | 107.3 | 111.8 | 111.1 | 106.4 | 3.6 | 3.3 | 2.2 | −.7 | −4.2 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| Output | 79.9 | 84.9 | 100.0 | 99.9 | 103.3 | 103.4 | 105.7 | 107.2 | 108.8 | 103.8 | 1.0 | 3.6 | 1.5 | 1.5 | −4.6 |
| Crops | 88.3 | 95.0 | 100.0 | 102.0 | 117.7 | 112.2 | 121.4 | 112.5 | 117.7 | 112.8 | −.2 | 1.3 | 3.1 | 4.6 | −4.2 |
| Animal products | 77.6 | 82.1 | 100.0 | 99.2 | 98.9 | 100.7 | 100.9 | 105.6 | 106.1 | 101.0 | 1.3 | 4.2 | 1.0 | .5 | −4.8 |
| Hungary: | | | | | | | | | | | | | | | |
| Output | 72.9 | 79.8 | 100.0 | 97.3 | 109.1 | 111.4 | 109.6 | 115.8 | 112.9 | 118.3 | 2.3 | 4.7 | 3.2 | −2.5 | 4.8 |
| Crops | 77.2 | 76.4 | 100.0 | 97.2 | 111.8 | 110.2 | 103.6 | 119.3 | 110.3 | 116.9 | 1.3 | 5.5 | 3.1 | −7.5 | 6.0 |
| Animal products | 70.0 | 82.2 | 100.0 | 97.4 | 107.3 | 112.1 | 113.6 | 113.4 | 114.7 | 119.3 | 2.9 | 4.2 | 3.3 | 1.1 | 4.0 |
| Poland: | | | | | | | | | | | | | | | |
| Output | 77.7 | 84.8 | 100.0 | 98.1 | 99.7 | 106.3 | 105.3 | 96.3 | 89.4 | 84.9 | 1.4 | 4.1 | .2 | −7.1 | −5.0 |
| Crops | 89.4 | 100.1 | 100.0 | 110.0 | 100.1 | 106.0 | 106.0 | 84.1 | 99.3 | 96.0 | 1.4 | .4 | −2.6 | 18.1 | −3.3 |
| Animal products | 72.9 | 78.6 | 100.0 | 93.2 | 99.6 | 106.4 | 104.9 | 101.2 | 85.4 | 80.5 | 1.4 | 5.8 | 1.4 | −15.6 | −5.8 |
| Romania: | | | | | | | | | | | | | | | |
| Output | 68.7 | 75.1 | 100.0 | 116.2 | 115.1 | 117.0 | 120.6 | 117.0 | 111.6 | 118.2 | 1.2 | 5.5 | 2.6 | −4.6 | 5.9 |
| Crops | 79.9 | 76.8 | 100.0 | 122.5 | 115.5 | 114.5 | 116.0 | 114.9 | 110.6 | 132.6 | −.7 | 4.5 | 1.5 | −3.7 | 19.9 |
| Animal products | 60.4 | 73.8 | 100.0 | 111.5 | 114.8 | 118.9 | 124.0 | 118.5 | 112.3 | 107.6 | 2.9 | 6.3 | 3.5 | −5.2 | −4.2 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| Output | 74.5 | 85.3 | 100.0 | 108.1 | 113.7 | 111.0 | 112.4 | 113.9 | 116.3 | 124.8 | 2.4 | 3.8 | 2.2 | 2.1 | 7.3 |
| Crops | 79.3 | 91.6 | 100.0 | 114.4 | 117.5 | 107.5 | 110.4 | 112.3 | 113.3 | 129.5 | 2.7 | 2.4 | 1.1 | .9 | 14.3 |
| Animal products | 71.0 | 80.7 | 100.0 | 103.5 | 110.8 | 113.6 | 113.9 | 115.1 | 118.6 | 121.4 | 2.1 | 5.0 | 2.9 | 3.1 | 2.3 |
| Total, Eastern Europe: | | | | | | | | | | | | | | | |
| Output | 75.7 | 83.8 | 100.0 | 102.5 | 105.6 | 108.3 | 109.1 | 107.3 | 105.2 | 105.9 | 1.7 | 3.9 | 1.6 | −2.0 | .7 |
| Crops | 84.4 | 90.9 | 100.0 | 108.5 | 108.5 | 108.1 | 108.9 | 104.3 | 107.5 | 114.9 | 1.0 | 2.1 | .6 | 3.1 | 6.8 |
| Animal products | 71.3 | 80.2 | 100.0 | 99.4 | 104.1 | 108.4 | 109.2 | 108.9 | 104.0 | 101.3 | 2.1 | 4.9 | 2.2 | −4.5 | −2.6 |

[1] Preliminary.

[2] Least squares fit of $I_o = I_o (1+r)^n$ was calculated for growth rates in all tables.

Sources: See appendix A. Indexes were calculated from physical quantities weighted by 1978 U.S. dollars.

The most spectacular rises in inputs from other sectors occurred in Bulgaria, with a more than two-fold increase, followed by Yugoslavia, Czechoslovakia, Hungary, Romania, and the GDR, while Poland experienced an actual decrease in inputs from 1975-1982.

Since inputs are subtracted from output to get the gross and net products of agriculture, the higher cost increases in relation to increases in output are reflected in more sluggish rates of growth in gross and net product. In fact, the growth rates of gross and net product of agriculture were negative in Bulgaria and Poland for the 1965-70 and 1975-80 period and for Romania and the GDR for the 1965-70 period. There was a better performance in the 1970-75 period for both gross and net products in all countries except Romania. In 1981-82, the performance in gross and net product, except for Bulgaria and Yugoslavia, was mediocre. The interrelationship of total output, inputs, and gross and net product can be readily followed country by country in Table 2 and 3.

### B. CHANGES IN STRUCTURE OF OUTPUT AND INPUTS

Structural changes of East European agriculture are shown in Table 4 in terms of percentage of output. Since the share of animal products increased in all countries during the period, the efficiency of the transformation of intermediate products into animal products probably increases, but in some countries the increased imports of feed in the 1970s [5] may have been the major factor in the rapidly expanding output of animal products compared to that of crops. The share of animal products in total output in 1981-82 was from 60 to 76 percent in the more industrialized countries, Czechoslovakia, the GDR, Hungary, and Poland, while in the developing countries of Southern Europe (Bulgaria, Yugoslavia, Romania), it was above one-half, between 54 and 57 percent. In all the countries, the share of expenses and depreciation has increased compared to the 1966-70 shares; correspondingly, the share of gross and net product declined. These greatly increased outside resources have brought no more favorable results for centralized agriculture than they have for privately operated farms in Western Europe.

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[5] U.S. Dept. of Agriculture, "Agricultural Situation: Eastern Europe," 1979, pp. 7-9, and "The Feed-Livestock Economy of Eastern Europe: Prospects to 1980's ERS, Foreign Agricultural Economic Report No. 90, 1973, p. 99. See also Cochrane, Cook, Cummings, and Vankai contribution to this series of volumes.

## TABLE 3.—GROWTH OF OPERATING EXPENSES INCLUDING DEPRECIATION, GROSS PRODUCT, AND NET PRODUCT OF AGRICULTURE

| | Indexes, 1975 = 100 | | | | | | | | | | Average annual rates of growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 [1] | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 [1] |
| **Bulgaria:** | | | | | | | | | | | | | | | |
| Expenses | 57.6 | 90.9 | 100.0 | 107.1 | 134.7 | 158.0 | 152.1 | 204.9 | 216.7 | 227.7 | 9.4 | 1.9 | 14.7 | 5.8 | 5.1 |
| Gross product | 90.4 | 88.6 | 100.0 | 103.4 | 90.7 | 92.3 | 101.1 | 83.9 | 88.9 | 93.0 | −1.4 | 2.0 | −2.6 | 5.9 | 4.6 |
| Net product | 95.9 | 90.5 | 100.0 | 102.8 | 86.8 | 87.7 | 96.9 | 76.8 | 81.1 | 84.4 | −2.1 | 1.5 | −4.2 | 5.5 | 4.1 |
| **Czechoslovakia:** | | | | | | | | | | | | | | | |
| Expenses | 64.0 | 84.2 | 100.0 | 104.4 | 104.3 | 114.2 | 115.9 | 119.3 | 137.2 | 135.4 | 4.4 | 4.1 | 3.7 | 15.0 | −1.3 |
| Gross product | 84.0 | 89.9 | 100.0 | 94.1 | 106.9 | 102.9 | 100.0 | 105.7 | 92.6 | 93.5 | 1.5 | 2.4 | 1.2 | −12.4 | .9 |
| Net product | 87.7 | 93.0 | 100.0 | 92.4 | 105.7 | 99.7 | 95.0 | 100.9 | 82.8 | 81.8 | 1.4 | 1.7 | .2 | −17.9 | −1.2 |
| **German Democratic Republic:** | | | | | | | | | | | | | | | |
| Expenses | 59.3 | 77.1 | 100.0 | 115.5 | 107.7 | 113.1 | 111.1 | 116.7 | 117.0 | 116.5 | 4.5 | 4.8 | 2.0 | .3 | −.5 |
| Gross product | 92.6 | 91.4 | 100.0 | 91.3 | 101.8 | 99.1 | 104.4 | 103.6 | 106.2 | 99.7 | −.2 | 2.7 | 1.6 | 2.6 | −6.2 |
| Net product | 99.1 | 95.0 | 100.0 | 89.0 | 100.2 | 96.6 | 102.0 | 100.6 | 103.1 | 94.8 | −.8 | 2.0 | 1.2 | 2.5 | −8.0 |
| **Hungary:** | | | | | | | | | | | | | | | |
| Expenses | 48.4 | 69.4 | 100.0 | 101.3 | 111.0 | 120.4 | 122.9 | 128.6 | 125.0 | 130.7 | 7.8 | 7.8 | 5.6 | −2.7 | 4.6 |
| Gross product | 86.3 | 84.9 | 100.0 | 96.3 | 109.4 | 106.9 | 103.4 | 110.1 | 108.4 | 113.7 | .3 | 3.5 | 1.9 | −1.5 | 4.9 |
| Net product | 91.8 | 87.9 | 100.0 | 94.0 | 107.5 | 103.8 | 98.6 | 105.2 | 102.9 | 108.0 | −.2 | 2.7 | 1.0 | −2.2 | 5.0 |
| **Poland:** | | | | | | | | | | | | | | | |
| Expenses | 46.9 | 70.3 | 100.0 | 92.3 | 99.0 | 105.2 | 112.4 | 107.4 | 83.9 | 79.9 | 11.7 | 8.8 | 2.9 | −21.9 | −4.7 |
| Gross product | 99.1 | 95.2 | 100.0 | 102.3 | 101.5 | 108.2 | 103.4 | 93.5 | 97.6 | 93.8 | −2.4 | 1.5 | −.7 | 4.4 | −3.9 |
| Net product | 104.2 | 97.4 | 100.0 | 101.8 | 100.2 | 107.0 | 100.7 | 89.1 | 93.0 | 88.2 | −3.1 | 1.1 | −1.5 | 4.4 | −5.2 |
| **Romania:** | | | | | | | | | | | | | | | |
| Expenses | 39.0 | 59.0 | 100.0 | 103.8 | 106.3 | 105.4 | 112.9 | 124.5 | 117.2 | 124.2 | 8.5 | 11.3 | 3.9 | −5.9 | 5.9 |
| Gross product | 91.4 | 88.7 | 100.0 | 126.5 | 124.3 | 129.8 | 130.5 | 115.0 | 114.1 | 121.2 | −1.0 | 1.6 | 2.4 | −.8 | 6.2 |
| Net product | 100.3 | 92.2 | 100.0 | 129.3 | 124.4 | 129.3 | 128.8 | 108.9 | 105.7 | 112.0 | −2.3 | .8 | 1.3 | −3.0 | 6.0 |
| **Yugoslavia:** | | | | | | | | | | | | | | | |
| Expenses | 69.2 | 77.3 | 100.0 | 123.2 | 124.7 | 144.0 | 121.4 | 130.0 | 127.3 | 136.0 | 2.3 | 7.6 | 4.1 | −2.1 | 6.8 |
| Gross product | 75.3 | 86.8 | 100.0 | 105.4 | 111.9 | 105.3 | 111.3 | 111.4 | 114.8 | 123.0 | 2.4 | 3.1 | 1.8 | 3.1 | 7.1 |
| Net product | 75.5 | 86.9 | 100.0 | 105.2 | 111.6 | 104.8 | 110.7 | 110.8 | 114.3 | 122.7 | 2.4 | 3.1 | 1.7 | 3.1 | 7.4 |
| **Total, Eastern Europe:** | | | | | | | | | | | | | | | |
| Expenses | 52.0 | 73.1 | 100.0 | 103.4 | 106.9 | 114.1 | 116.3 | 121.9 | 116.1 | 117.6 | 7.6 | 7.1 | 4.1 | −4.8 | 1.3 |
| Gross product | 89.6 | 90.3 | 100.0 | 102.7 | 106.1 | 106.7 | 107.5 | 102.3 | 103.4 | 104.4 | −.4 | 2.3 | .7 | 1.1 | 1.0 |
| Net product | 94.3 | 92.5 | 100.0 | 102.0 | 104.7 | 104.6 | 104.6 | 98.2 | 98.4 | 98.6 | −1.0 | 1.8 | 0 | .2 | .3 |

[1] Preliminary.

Sources: See appendix A.

## TABLE 4.—PERCENTAGE DISTRIBUTION OF OUTPUT, EXPENSES AND DEPRECIATION, GROSS PRODUCT, AND NET PRODUCT IN AGRICULTURE

[Output of agriculture = 100]

| Area and period | Output of agriculture | | | Expenses and depreciation | Gross product | Net product |
|---|---|---|---|---|---|---|
| | Total | Crops | Animal products | | | |
| Bulgaria: | | | | | | |
| 1966-70 | 100 | 60 | 40 | 32 | 74 | 68 |
| 1976-80 | 100 | 47 | 53 | 33 | 79 | 67 |
| 1981-82 | 100 | 46 | 54 | 44 | 69 | 56 |
| Czechoslovakia: | | | | | | |
| 1966-70 | 100 | 32 | 68 | 52 | 61 | 48 |
| 1976-80 | 100 | 23 | 77 | 50 | 59 | 50 |
| 1981-82 | 100 | 24 | 76 | 59 | 52 | 41 |
| German Democratic Republic: | | | | | | |
| 1966-70 | 100 | 30 | 70 | 32 | 76 | 68 |
| 1976-80 | 100 | 26 | 74 | 45 | 65 | 55 |
| 1981-82 | 100 | 26 | 74 | 45 | 65 | 55 |
| Hungary: | | | | | | |
| 1966-70 | 100 | 47 | 53 | 30 | 77 | 70 |
| 1976-80 | 100 | 40 | 60 | 49 | 60 | 51 |
| 1981-82 | 100 | 40 | 60 | 50 | 59 | 50 |
| Poland: | | | | | | |
| 1966-70 | 100 | 36 | 64 | 32 | 74 | 68 |
| 1976-80 | 100 | 29 | 71 | 40 | 67 | 60 |
| 1981-82 | 100 | 32 | 68 | 37 | 73 | 63 |
| Romania: | | | | | | |
| 1966-70 | 100 | 54 | 46 | 33 | 77 | 66 |
| 1976-80 | 100 | 42 | 58 | 49 | 62 | 51 |
| 1981-82 | 100 | 45 | 55 | 54 | 60 | 46 |
| Yugoslavia: | | | | | | |
| 1966-70 | 100 | 54 | 46 | 15 | 89 | 85 |
| 1976-80 | 100 | 43 | 57 | 18 | 86 | 82 |
| 1981-82 | 100 | 43 | 57 | 17 | 87 | 83 |
| Total, Eastern Europe: | | | | | | |
| 1966-70 | 100 | 43 | 57 | 32 | 76 | 68 |
| 1976-80 | 100 | 34 | 66 | 41 | 68 | 59 |
| 1981-82 | 100 | 36 | 64 | 43 | 68 | 57 |

Sources: Output was calculated from physical quantities weighted by 1978 U.S. dollars. All other items were calculated from output and percentage distribution of these items given in national currencies (see appendix A).

### C. CONTRIBUTION OF INDIVIDUAL COUNTRIES TO THE TOTAL OUTPUT AND INPUTS OF EASTERN EUROPE

The relative importance of each country as a supplier of agricultural output is shown in Table 5. Bulgaria, the smallest country, supplied only about 8.3 percent of the agricultural output of Eastern Europe in 1981-82. In ascending order of importance came Czechoslovakia (11.2 percent), Hungary (11.3 percent), Yugoslavia, Romania and the GDR (14.4 to 16.0 percent), and Poland, the largest supplier, accounting for 23.7 percent of the total output. The importance of Poland declined, and the share of crops increased for Hungary, the GDR, and Romania from 1966-70 to 1981-82. The share of animal output increased for all countries except Poland.

The share of total expenses increased for the GDR, Hungary, and Romania from 1966-70 to 1981-82. In terms of gross and net product, the shares in the total for Eastern Europe of individual countries do not show any pronounced changes from 1966-70 to 1981-82.

## IV. PER CAPITA TRENDS AND LEVELS OF OUTPUT

### A. PER CAPITA OUTPUT

Trends in per capita output express changes in levels of domestically produced food. Tables 6–8 show the trends from 1965 to 1982 in agricultural output measures in relation to population for individual countries. In general, the per capita trends are similar to the total performance measures except that the rates of change are slowed down by increases in population (Table 6).

The behavior of output per capita for individual countries is summarized in Table 6. From 1965 to 1982 Hungary, Romania, and Yugoslavia experienced the highest growth of per capita output, 54, 46, and 45 percent respectively, followed by Czechoslovakia, the GDR, and Bulgaria with 35, 32, and 30 percent growth respectively, while Poland experienced a decrease by 5 percent. In most countries, per capita output of animal products increased at a higher annual rate than that of crops, in line with the effort to improve protein content in national diets.

TABLE 5.—PERCENTAGE CONTRIBUTION OF INDIVIDUAL COUNTRIES TO OUTPUT, EXPENSES AND DEPRECIATION, GROSS PRODUCT, AND NET PRODUCT IN AGRICULTURE

[Eastern Europe = 100]

| Country | Agricultural output | | | Crop output | | | Animal output | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1966–70 | 1976–80 | 1981–82 | 1966–70 | 1976–80 | 1981–82 | 1966–70 | 1976–80 | 1981–82 |
| Bulgaria | 8.5 | 7.5 | 8.3 | 11.9 | 10.3 | 10.8 | 6.0 | 6.0 | 7.0 |
| Czechoslovakia | 10.9 | 10.8 | 11.2 | 8.0 | 7.3 | 7.4 | 13.1 | 12.6 | 13.3 |
| German Democratic Republic | 14.6 | 15.5 | 16.0 | 10.2 | 11.6 | 11.5 | 17.9 | 17.4 | 18.5 |
| Hungary | 10.8 | 10.5 | 11.3 | 11.8 | 12.3 | 12.5 | 10.0 | 9.5 | 10.6 |
| Poland | 27.4 | 27.2 | 23.7 | 23.2 | 22.9 | 21.4 | 30.5 | 29.4 | 24.9 |
| Romania | 14.1 | 15.4 | 15.2 | 17.6 | 19.1 | 19.2 | 11.5 | 13.4 | 13.0 |
| Yugoslavia | 13.8 | 13.3 | 14.4 | 17.3 | 16.5 | 17.2 | 11.1 | 11.6 | 12.9 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Expenses and depreciation | | | Gross product | | | Net product | | |
| Bulgaria | 8.6 | 6.1 | 8.6 | 8.3 | 8.7 | 8.5 | 8.5 | 8.5 | 8.1 |
| Czechoslovakia | 17.8 | 13.2 | 15.6 | 8.7 | 9.4 | 8.6 | 7.6 | 9.1 | 7.9 |
| German Democratic Republic | 14.7 | 17.0 | 16.9 | 14.7 | 14.8 | 15.4 | 14.5 | 14.4 | 15.2 |
| Hungary | 10.3 | 12.6 | 13.3 | 10.9 | 9.2 | 9.8 | 11.0 | 9.1 | 9.8 |
| Poland | 27.4 | 26.8 | 20.4 | 26.9 | 26.9 | 25.6 | 27.3 | 27.5 | 26.0 |
| Romania | 14.9 | 18.4 | 19.3 | 14.3 | 14.1 | 13.4 | 13.8 | 13.3 | 12.2 |
| Yugoslavia | 6.3 | 6.0 | 5.9 | 16.2 | 16.9 | 18.6 | 17.3 | 18.2 | 20.8 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Sources: Output was calculated from physical quantities weighted by 1978 U.S. dollars. Expenses and depreciation, gross and net product were calculated from output and percentage distribution of these items given in national currencies (see app. A).

## TABLE 6.—PER CAPITA GROWTH OF AGRICULTURAL OUTPUT

| | Indexes, 1975=100 | | | | | | | | | | Average annual rates of growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982[1] | 1965–70 | 1970–75 | 1975–80 | 1981 | 1992[1] |
| Bulgaria: | | | | | | | | | | | | | | | |
| Output | 87.9 | 93.1 | 100.0 | 103.3 | 96.7 | 102.6 | 108.1 | 104.2 | 109.7 | 114.4 | 0.4 | 1.1 | 1.1 | 5.3 | 4.2 |
| Crops | 102.4 | 104.7 | 100.0 | 106.8 | 91.4 | 98.8 | 101.8 | 95.2 | 102.5 | 108.7 | –.6 | –.9 | –.9 | 7.6 | 6.1 |
| Animal products | 73.9 | 82.0 | 100.0 | 100.1 | 101.8 | 106.1 | 114.1 | 112.8 | 116.6 | 119.8 | 1.7 | 3.5 | 3.0 | 3.4 | 2.7 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| Output | 76.4 | 90.5 | 100.0 | 97.3 | 103.4 | 104.2 | 101.8 | 105.9 | 104.8 | 103.1 | 2.8 | 2.5 | 1.2 | –1.1 | –1.6 |
| Crops | 81.8 | 95.9 | 100.0 | 88.8 | 104.2 | 101.8 | 94.4 | 99.1 | 96.7 | 104.9 | 1.6 | 1.9 | .3 | –2.4 | 8.5 |
| Animal products | 74.7 | 88.7 | 100.0 | 100.0 | 103.2 | 104.9 | 104.2 | 108.1 | 107.4 | 102.5 | 3.3 | 2.6 | 1.5 | –.7 | –4.5 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| Output | 79.1 | 83.8 | 100.0 | 100.3 | 103.8 | 104.0 | 106.4 | 107.9 | 109.6 | 104.5 | .9 | 3.8 | 1.6 | 1.5 | –4.6 |
| Crops | 87.4 | 93.9 | 100.0 | 102.4 | 118.3 | 112.8 | 122.1 | 113.3 | 118.5 | 113.6 | –.2 | 1.6 | 3.2 | 4.6 | –4.2 |
| Animal products | 76.8 | 81.1 | 100.0 | 99.6 | 99.4 | 101.2 | 101.5 | 106.3 | 106.8 | 101.7 | 1.3 | 4.5 | 1.1 | .5 | –4.8 |
| Hungary: | | | | | | | | | | | | | | | |
| Output | 75.6 | 81.3 | 100.0 | 96.8 | 108.0 | 109.9 | 107.9 | 113.8 | 111.0 | 116.4 | 1.9 | 4.4 | 2.9 | –2.5 | 4.9 |
| Crops | 80.1 | 77.9 | 100.0 | 96.7 | 110.7 | 108.7 | 102.0 | 117.3 | 108.4 | 115.0 | 1.0 | 5.2 | 2.7 | –7.6 | 6.1 |
| Animal products | 72.6 | 83.7 | 100.0 | 96.9 | 106.2 | 110.6 | 111.9 | 111.5 | 112.8 | 117.4 | 2.5 | 3.8 | 3.0 | 1.1 | 4.1 |
| Poland: | | | | | | | | | | | | | | | |
| Output | 83.9 | 88.7 | 100.0 | 97.1 | 97.8 | 103.3 | 101.6 | 92.1 | 84.7 | 79.8 | .7 | 3.2 | –.6 | –8.0 | –5.9 |
| Crops | 96.6 | 104.7 | 100.0 | 108.9 | 98.1 | 103.0 | 102.3 | 80.4 | 94.1 | 90.2 | .7 | –.5 | –3.5 | 17.1 | –4.2 |
| Animal products | 78.7 | 82.2 | 100.0 | 92.3 | 97.7 | 103.4 | 101.3 | 96.8 | 80.9 | 75.6 | .7 | 4.9 | .5 | –16.4 | –6.6 |
| Romania: | | | | | | | | | | | | | | | |
| Output | 76.7 | 78.7 | 100.0 | 115.1 | 112.9 | 113.8 | 116.2 | 111.9 | 106.1 | 111.8 | –.1 | 4.5 | 1.7 | –5.2 | 5.4 |
| Crops | 89.3 | 80.5 | 100.0 | 121.3 | 113.3 | 111.3 | 111.8 | 110.0 | 105.1 | 125.4 | –2.0 | 3.5 | .6 | –4.4 | 19.3 |
| Animal products | 67.5 | 77.4 | 100.0 | 110.4 | 112.6 | 115.6 | 119.5 | 113.4 | 106.8 | 101.7 | 1.5 | 5.3 | 2.6 | –5.9 | –4.7 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| Output | 81.9 | 89.5 | 100.0 | 107.0 | 111.5 | 108.0 | 108.4 | 109.1 | 111.0 | 118.5 | 1.4 | 2.8 | 1.3 | 1.7 | 6.8 |
| Crops | 87.2 | 96.1 | 100.0 | 113.3 | 115.3 | 104.5 | 106.4 | 107.6 | 108.1 | 123.0 | 1.7 | 1.4 | .2 | .4 | 13.8 |
| Animal products | 78.0 | 84.7 | 100.0 | 102.5 | 108.7 | 110.5 | 109.8 | 110.2 | 113.1 | 115.2 | 1.1 | 4.0 | 2.0 | 2.6 | 1.9 |
| Total, Eastern Europe: | | | | | | | | | | | | | | | |
| Output | 80.8 | 86.6 | 100.0 | 101.8 | 104.1 | 106.0 | 106.2 | 103.9 | 101.4 | 101.6 | 1.0 | 3.2 | 1.0 | –2.4 | .2 |
| Crops | 90.1 | 93.9 | 100.0 | 107.8 | 107.0 | 105.9 | 106.0 | 101.0 | 103.7 | 110.2 | .3 | 1.5 | 0 | 2.6 | 6.3 |
| Animal products | 76.1 | 82.9 | 100.0 | 98.7 | 102.6 | 106.1 | 106.4 | 105.4 | 100.3 | 97.2 | 1.4 | 4.2 | 1.5 | –4.9 | –3.0 |

[1] Preliminary.

Sources: Data in table 2 divided by population data taken from statistical yearbooks of respective countries (see app. A).

The trend in per capita inputs exhibited an ascending pattern similar to that of total inputs in all the countries under study. Gross and net product per capita, however, were declining in the first period in most countries, but they were increasing in the second period and slowing down in the third period in most countries (Table 7). It should be noted that in the GDR the population had been declining since 1967, which favorably affected the per capita measures.[6]

### B. PER CAPITA LEVELS OF OUTPUT

Table 8 shows per capita comparisons of levels of output, and gross and net product in agriculture in relation to the East European level, for individual countries in selected periods. These findings show that the per capita level of agricultural output was lower in Czechoslovakia, Poland, Romania, and Yugoslavia than the average level for Eastern Europe, while Bulgaria, Hungary, and the German Democratic Republic were significantly above that level. Hungary has been and is the highest per capita producer of agricultural output. Bulgaria and Hungary ranked highest in per capita output of crops, while the German Democratic Republic, Hungary, and Czechoslovakia excelled in per capita output of animal products. The levels of gross and net product per capita follow roughly the output pattern for individual countries. Bulgaria, the German Democratic Republic, Hungary, and Yugoslavia rank above the average; Czechoslovakia and Romania are below the average level of Eastern Europe as a whole, while Poland dropped below the average in 1981-82.

## V. Productivity of Land and Livestock

### A. AGRICULTURAL LAND AND LAND PER FARM WORKER

In most East European countries, the area of agricultural land[7] remained relatively stable during the period under study. In Czechoslovakia, the GDR, Hungary, Poland, and Yugoslavia, agricultural land declined by two to five percent, while in Bulgaria and Romania it increased by one to seven percent in the same period.[8] Poland has close to 26 percent of the total agricultural land in Eastern Europe, followed by Romania and Yugoslavia with close to 19 or 20 percent each. The remaining four countries each held between 8 and 9 percent of the total agricultural land in Eastern Europe.

In comparison to the US standard, the agricultural land per person employed in agriculture is very small in all the East European countries (Table 9). Because of the continuing rapid decline in agricultural employment in the last eighteen years, agricultural land per person employed in agriculture rose in all countries. By 1982, the number of hectares per person employed in agriculture ranged from 4.4 in Poland to 7.5 in the GDR, with 5.2 hectares the average for all Eastern Europe.

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[6] Germany (Democratic Republic). Staatliche Zentralverwaltung für Statistik. Statistisches Jahrbuch der Deutschen Demokratischen Republik, 1982, Berlin, 1982, p. 1.

[7] Agricultural land comprises all arable land, orchards, gardens, vineyards, permanent and temporary meadows, pastures, and grazing land.

[8] See Sovet ekonomicheskoi vzaimopomoshchi. Sekretariat. Statisticheskii Ezhegodnik Stran-Chlenov, 1982, Moscow, 1982, p. 178, and national statistical yearbooks.

### B. GROWTH OF OUTPUT AND INPUTS PER UNIT OF LAND

As a result of the relative stability of the area in agricultural land, the output and input measures per unit of land followed the same general trends over the period under review as the total performance measures given in Tables 2 and 3.

## TABLE 7.—PER CAPITA GROWTH OF GROSS AND NET PRODUCT IN AGRICULTURE

| | Indexes, 1975=100 | | | | | | | | | | Average annual rates of growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 [1] | 1965-70 | 1970-75 | 1975-80 | 1981 | 1982 [1] |
| Bulgaria: | | | | | | | | | | | | | | | |
| Gross product | 96.1 | 91.0 | 100.0 | 103.0 | 89.8 | 91.3 | 99.9 | 82.6 | 87.2 | 90.9 | −2.0 | 1.5 | −2.9 | 5.5 | 4.3 |
| Net product | 102.0 | 93.0 | 100.0 | 102.4 | 86.0 | 86.8 | 95.7 | 75.6 | 79.5 | 82.6 | −2.8 | 1.0 | −4.4 | 5.2 | 3.9 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| Gross product | 87.8 | 92.8 | 100.0 | 93.4 | 105.2 | 100.6 | 97.1 | 102.2 | 83.5 | 90.0 | 1.3 | 1.7 | 0.5 | −12.4 | 0.6 |
| Net product | 91.6 | 96.1 | 100.0 | 91.7 | 104.1 | 97.5 | 92.3 | 97.5 | 80.1 | 78.8 | 1.1 | 1.1 | −0.5 | −17.8 | −1.6 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| Gross product | 91.7 | 90.3 | 100.0 | 91.6 | 102.4 | 99.7 | 105.1 | 104.3 | 107.0 | 100.4 | −.3 | 3.0 | 1.7 | 2.6 | −6.2 |
| Net product | 98.1 | 93.9 | 100.0 | 89.3 | 100.7 | 97.1 | 102.6 | 101.3 | 103.8 | 95.5 | −.8 | 2.3 | 1.3 | 2.5 | −8.0 |
| Hungary: | | | | | | | | | | | | | | | |
| Gross product | 89.5 | 86.5 | 100.0 | 95.8 | 108.3 | 105.5 | 101.7 | 108.2 | 106.6 | 111.9 | −.1 | 3.1 | 1.6 | −1.5 | 4.9 |
| Net product | 95.3 | 89.6 | 100.0 | 93.5 | 106.5 | 102.4 | 97.1 | 103.4 | 101.1 | 106.3 | −.6 | 2.3 | 0.7 | −2.2 | 5.1 |
| Poland: | | | | | | | | | | | | | | | |
| Gross product | 107.1 | 99.6 | 100.0 | 101.3 | 99.5 | 105.1 | 99.8 | 89.4 | 92.5 | 88.1 | −3.1 | .6 | −1.6 | 3.5 | −4.7 |
| Net product | 112.6 | 101.8 | 100.0 | 100.8 | 98.3 | 103.9 | 97.2 | 85.2 | 88.1 | 82.8 | −3.8 | .2 | −2.4 | 3.4 | −6.0 |
| Romania: | | | | | | | | | | | | | | | |
| Gross product | 102.1 | 93.1 | 100.0 | 125.3 | 121.9 | 126.2 | 125.7 | 110.0 | 108.4 | 114.6 | −2.3 | .6 | 1.5 | −1.5 | 5.7 |
| Net product | 112.0 | 96.7 | 100.0 | 128.1 | 122.1 | 125.7 | 124.1 | 104.3 | 100.4 | 105.9 | −3.6 | −.1 | .4 | −3.7 | 5.5 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| Gross product | 82.8 | 91.0 | 100.0 | 104.4 | 109.7 | 102.3 | 107.3 | 106.7 | 109.5 | 116.8 | 1.5 | 2.1 | 1.0 | 2.7 | 6.7 |
| Net product | 83.0 | 91.2 | 100.0 | 104.2 | 109.4 | 101.9 | 106.7 | 106.2 | 109.0 | 116.5 | 1.4 | 2.1 | .9 | 2.6 | 6.9 |
| Total, Eastern Europe: | | | | | | | | | | | | | | | |
| Gross product | 95.7 | 93.3 | 100.0 | 102.0 | 104.6 | 104.5 | 104.7 | 99.0 | 99.6 | 100.2 | −1.1 | 1.6 | .1 | .6 | .6 |
| Net product | 100.6 | 95.7 | 100.0 | 101.3 | 103.3 | 102.5 | 101.9 | 95.1 | 94.8 | 94.6 | −1.7 | 1.1 | −.7 | −.3 | 0 |

[1] Preliminary.

Sources: Data in table 3 divided by population data taken from statistical yearbooks of respective countries (see app. A).

## TABLE 8.—PER CAPITA COMPARISONS OF LEVELS OF OUTPUT, AND GROSS AND NET PRODUCT IN AGRICULTURE

[Eastern Europe = 100]

| | Agricultural output | | | Crop output | | | Animal output | | | Gross product | | | Net product | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] |
| Bulgaria | 124.0 | 110.7 | 123.8 | 172.9 | 152.0 | 160.3 | 87.3 | 89.2 | 103.6 | 121.6 | 128.4 | 126.3 | 123.2 | 125.0 | 120.8 |
| Czechoslovakia | 92.6 | 92.5 | 96.4 | 68.0 | 62.6 | 62.7 | 111.1 | 108.1 | 114.5 | 74.0 | 80.5 | 74.7 | 64.9 | 77.9 | 68.1 |
| German Democratic Republic | 104.1 | 120.1 | 126.5 | 72.6 | 90.4 | 91.0 | 127.8 | 135.5 | 146.2 | 104.7 | 115.2 | 122.3 | 103.8 | 111.9 | 120.8 |
| Hungary | 128.3 | 128.0 | 139.5 | 140.4 | 150.7 | 155.1 | 119.2 | 116.2 | 130.9 | 129.4 | 112.6 | 121.9 | 131.2 | 110.5 | 121.2 |
| Poland | 103.6 | 101.2 | 87.0 | 87.9 | 85.2 | 78.6 | 115.4 | 109.4 | 91.6 | 101.7 | 100.2 | 94.1 | 103.5 | 102.3 | 95.8 |
| Romania | 87.4 | 91.5 | 90.0 | 109.3 | 113.6 | 113.9 | 71.0 | 80.1 | 76.8 | 88.8 | 84.0 | 79.2 | 85.2 | 79.3 | 72.1 |
| Yugoslavia | 83.8 | 78.6 | 85.2 | 105.5 | 97.7 | 101.8 | 67.5 | 68.6 | 76.0 | 98.8 | 100.0 | 109.9 | 105.2 | 108.0 | 122.6 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

[1] Preliminary.

Sources: Calculated from physical quantities weighted by 1978 U.S. dollars divided by population data (see app. A).

TABLE 9.—AGRICULTURAL LAND PER PERSON EMPLOYED IN AGRICULTURE

| | Hectares per person employed | | | | | Indexes,[1] 1975=100 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1980 | 1982[2] | 1965 | 1970 | 1975 | 1980 | 1982[2] |
| Bulgaria | 3.3 | 4.1 | 5.0 | 6.0 | 6.1 | 65.3 | 82.1 | 100.0 | 119.0 | 122.2 |
| Czechoslovakia | 5.7 | 6.0 | 6.9 | 7.2 | 7.1 | 83.1 | 87.9 | 100.0 | 105.4 | 103.6 |
| German Democratic Republic | 5.6 | 6.6 | 7.4 | 7.5 | 7.5 | 76.0 | 89.0 | 100.0 | 101.7 | 101.0 |
| Hungary | 5.5 | 5.8 | 6.6 | 6.7 | 6.6 | 83.1 | 88.1 | 100.0 | 101.7 | 100.1 |
| Poland | 3.7 | 3.8 | 4.0 | 4.4 | 4.4 | 93.9 | 94.9 | 100.0 | 111.2 | 111.8 |
| Romania | 2.7 | 3.0 | 3.8 | 4.8 | 5.1 | 70.9 | 79.3 | 100.0 | 126.3 | 133.3 |
| Yugoslavia | 3.4 | 3.7 | 4.0 | 4.4 | 4.6 | 84.4 | 91.9 | 100.0 | 109.9 | 114.4 |
| Total, Eastern Europe | 3.7 | 4.0 | 4.5 | 5.1 | 5.2 | 81.0 | 88.0 | 100.0 | 113.1 | 115.5 |

[1] Indexes are calculated from unrounded data.

[2] Preliminary.

Source: See app. A.

Tables 10 and 11 show the trends of various measures of production and expenses per hectare of agricultural land by country and region. In general, the productivity of land increased in all the countries. However, the economically less developed countries, except Bulgaria, had the larger annual rates of increase because their production per unit of land was low in the earlier postwar years. In all countries the average annual rate of growth of output of animal products per unit of land, 1965–80, exceeded that of output of crops except in Hungary for 1970–75 and the German Democratic Republic for 1975–80. The 1981 and 1982 rates cover too short a span to afford general conclusions.

Current operating expenses per unit of land increased from 1965 to 1982 most in Bulgaria and Romania (3.7 and 3.2 times, respectively), followed by Hungary (2.9 times), Czechoslovakia (2.2 times), the GDR and Yugoslavia (2 times), Poland (1.8 times), and Eastern Europe as a whole (2.3 times). From 1965 to 1982, gross and net product per unit of land increased fastest in Yugoslavia (68 and 67 percent, respectively), followed by Hungary (39 and 24 percent, respectively), Romania (31 and 11 percent), Czechoslovakia (17 and −2 percent), the GDR (9 and −3 percent), and a decrease in Poland (−2 and −12 percent) and Bulgaria (−3 and −17 percent). The rates were higher for all countries in the 1960–65 period than in 1965–70 and 1975–82, except for gross and net product in Romania.

### C. COMPARISON OF LEVELS OF OUTPUT AND INPUT PER UNIT OF LAND

Relative levels of productivity of land in relation to the East European average as a base are shown in Table 12. Over the postwar period the differences among countries in productivity of land have been reduced, but in 1981–82 they were still very large, and they were greater in the output of animal products than in that of crops. In 1980–82, for example, the GDR produced more than three times as much animal products per hectare as either Romania or Yugoslavia. Levels of animal output were substantially higher in the more industrialized countries.

There have been even larger differences in inputs per hectare among East European countries. Czechoslovakia's and the GDR's levels were over 5 times as large as Yugoslavia's in 1980–82. The use of non-agricultural inputs per unit of land in the more advanced countries was far higher than in the less advanced countries. Differences in levels of gross and net product per hectare among countries of Eastern Europe were smaller than those of input. The level of Romanian gross and net product per unit of land remained the lowest and that of the GDR the highest among the East European countries during the period under study.

## TABLE 10.—GROWTH OF AGRICULTURAL OUTPUT PER HECTARE OF AGRICULTURAL LAND

| | Indexes, 1975=100 | | | | | | | | | | Average annual rates of growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 [1] | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 [1] |
| Bulgaria: | | | | | | | | | | | | | | | |
| Output | 84.9 | 89.8 | 100.0 | 99.7 | 93.7 | 99.3 | 105.0 | 102.0 | 107.8 | 112.6 | 0.2 | 1.9 | 0.9 | 5.7 | 4.5 |
| Crops | 98.9 | 101.0 | 100.0 | 103.0 | 88.6 | 95.7 | 98.9 | 93.2 | 100.7 | 107.1 | -.7 | -.2 | -1.1 | 8.1 | 6.3 |
| Animal products | 71.4 | 79.1 | 100.0 | 96.6 | 98.6 | 102.8 | 110.8 | 110.4 | 114.6 | 118.0 | 1.6 | 4.2 | 2.7 | 3.8 | 3.0 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| Output | 71.5 | 86.7 | 100.0 | 98.4 | 105.6 | 107.4 | 106.1 | 111.7 | 111.2 | 110.4 | 3.3 | 3.3 | 2.3 | -.5 | -.7 |
| Crops | 76.6 | 91.9 | 100.0 | 89.8 | 106.4 | 105.0 | 98.3 | 104.5 | 102.6 | 112.4 | 2.1 | 2.8 | 1.4 | -1.8 | 9.6 |
| Animal products | 69.9 | 85.0 | 100.0 | 101.2 | 105.4 | 108.2 | 108.6 | 114.0 | 113.9 | 109.8 | 3.8 | 3.5 | 2.6 | -.1 | -3.6 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| Output | 79.1 | 85.0 | 100.0 | 99.9 | 103.4 | 103.6 | 106.0 | 107.7 | 109.4 | 104.4 | 1.2 | 3.5 | 1.6 | 1.6 | -4.6 |
| Crops | 87.4 | 95.2 | 100.0 | 102.0 | 117.8 | 112.4 | 121.7 | 113.0 | 118.3 | 113.4 | .0 | 1.3 | 3.2 | 4.7 | -4.1 |
| Animal products | 76.8 | 82.2 | 100.0 | 99.3 | 98.9 | 100.9 | 101.1 | 106.0 | 106.6 | 101.5 | 1.6 | 4.2 | 1.1 | .5 | -4.7 |
| Hungary: | | | | | | | | | | | | | | | |
| Output | 71.0 | 78.6 | 100.0 | 97.5 | 109.8 | 112.6 | 111.6 | 118.3 | 115.8 | 121.8 | 2.5 | 5.1 | 3.7 | -2.1 | 5.2 |
| Crops | 75.2 | 75.3 | 100.0 | 97.4 | 112.5 | 111.4 | 105.5 | 121.9 | 113.1 | 120.4 | 1.6 | 5.9 | 3.5 | -7.2 | 6.4 |
| Animal products | 68.1 | 80.9 | 100.0 | 97.6 | 108.0 | 113.3 | 115.7 | 115.9 | 117.6 | 122.8 | 3.1 | 4.5 | 3.8 | 1.5 | 4.4 |
| Poland: | | | | | | | | | | | | | | | |
| Output | 76.0 | 83.4 | 100.0 | 98.4 | 100.2 | 107.1 | 106.5 | 97.6 | 90.8 | 86.5 | 1.5 | 4.5 | .5 | -7.0 | -4.8 |
| Crops | 87.4 | 98.4 | 100.0 | 110.4 | 100.6 | 106.8 | 107.2 | 85.2 | 100.9 | 97.8 | 1.5 | .7 | -2.3 | 18.4 | -3.1 |
| Animal products | 71.3 | 77.2 | 100.0 | 93.5 | 100.1 | 107.2 | 106.2 | 102.6 | 86.8 | 81.9 | 1.5 | 6.2 | 1.7 | -15.4 | -5.6 |
| Romania: | | | | | | | | | | | | | | | |
| Output | 69.5 | 75.1 | 100.0 | 116.1 | 115.0 | 116.9 | 120.4 | 116.8 | 111.6 | 118.4 | 1.0 | 5.5 | 2.6 | -4.5 | 6.1 |
| Crops | 80.8 | 76.8 | 100.0 | 122.4 | 115.3 | 114.3 | 115.8 | 114.8 | 110.6 | 132.7 | -.9 | 4.5 | 1.5 | -3.6 | 20.0 |
| Animal products | 61.1 | 73.9 | 100.0 | 111.4 | 114.7 | 118.8 | 123.9 | 118.4 | 112.3 | 107.7 | 2.7 | 6.3 | 3.5 | -5.1 | -4.1 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| Output | 72.8 | 84.0 | 100.0 | 108.6 | 114.6 | 112.3 | 113.6 | 114.7 | 117.2 | 125.7 | 2.6 | 4.1 | 2.3 | 2.2 | 7.3 |
| Crops | 77.5 | 90.2 | 100.0 | 114.9 | 118.5 | 108.7 | 111.5 | 113.1 | 114.1 | 130.5 | 2.9 | 2.7 | 1.3 | .9 | 14.3 |
| Animal products | 69.4 | 79.5 | 100.0 | 104.0 | 111.7 | 114.9 | 115.0 | 115.8 | 119.4 | 122.2 | 2.2 | 5.3 | 3.1 | 3.1 | 2.4 |
| Total, Eastern Europe: | | | | | | | | | | | | | | | |
| Output | 74.9 | 82.9 | 100.0 | 102.4 | 105.6 | 108.5 | 109.5 | 107.9 | 106.0 | 106.9 | 1.7 | 4.1 | 1.8 | -1.8 | .8 |
| Crops | 83.4 | 89.9 | 100.0 | 108.4 | 108.6 | 108.4 | 109.3 | 104.9 | 108.3 | 115.9 | 1.0 | 2.3 | .7 | 3.3 | 7.0 |
| Animal products | 70.5 | 79.4 | 100.0 | 99.3 | 104.1 | 108.6 | 109.7 | 109.5 | 104.8 | 102.3 | 2.1 | 5.1 | 2.3 | -4.3 | -2.4 |

[1] Preliminary.

Sources: Data in table 2 were divided by acreage of agricultural land taken from statistical yearbooks of respective countries (see app. A).

## TABLE 11.—GROWTH OF OPERATING EXPENSES INCLUDING DEPRECIATION, GROSS AND NET PRODUCT PER HECTARE OF AGRICULTURAL LAND

| | Indexes, 1975=100 | | | | | | | | | | [1] Average annual rates of growth | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 |
| **Bulgaria:** | | | | | | | | | | | | | | | |
| Expenses | 59.1 | 90.1 | 100.0 | 102.9 | 129.2 | 151.4 | 145.9 | 197.3 | 208.9 | 219.4 | 8.5 | 2.1 | 14.1 | 5.9 | 5.0 |
| Gross product | 92.8 | 87.8 | 100.0 | 99.4 | 87.0 | 88.4 | 97.0 | 80.8 | 85.7 | 89.6 | −2.2 | 2.2 | −3.2 | 6.0 | 4.6 |
| Net product | 98.5 | 89.7 | 100.0 | 98.8 | 83.3 | 84.1 | 92.9 | 74.0 | 78.2 | 81.3 | −2.9 | 1.8 | −4.7 | 5.6 | 4.1 |
| **Czechoslovakia:** | | | | | | | | | | | | | | | |
| Expenses | 62.6 | 83.3 | 100.0 | 104.8 | 104.9 | 115.2 | 117.3 | 121.7 | 140.7 | 139.7 | 4.6 | 4.3 | 4.1 | 15.7 | −.7 |
| Gross product | 82.2 | 88.9 | 100.0 | 94.5 | 107.5 | 103.7 | 101.2 | 107.8 | 95.0 | 96.5 | 1.8 | 2.6 | 1.6 | −11.9 | 1.5 |
| Net product | 85.8 | 92.1 | 100.0 | 92.7 | 106.3 | 100.5 | 96.2 | 102.9 | 85.0 | 84.4 | 1.6 | 1.9 | .6 | −17.4 | −.6 |
| **German Democratic Republic:** | | | | | | | | | | | | | | | |
| Expenses | 58.7 | 77.2 | 100.0 | 115.6 | 107.8 | 113.4 | 111.4 | 117.2 | 117.6 | 117.2 | 4.8 | 4.8 | 2.1 | .4 | −.4 |
| Gross product | 91.7 | 91.6 | 100.0 | 91.3 | 101.9 | 99.3 | 104.7 | 104.0 | 106.8 | 100.2 | 0 | 2.7 | 1.7 | 2.7 | −6.1 |
| Net product | 98.1 | 95.2 | 100.0 | 89.0 | 100.3 | 96.8 | 102.2 | 101.0 | 103.6 | 95.4 | −.5 | 2.0 | 1.2 | 2.5 | −7.9 |
| **Hungary:** | | | | | | | | | | | | | | | |
| Expenses | 47.1 | 68.3 | 100.0 | 101.5 | 111.7 | 121.7 | 125.1 | 131.4 | 128.2 | 134.6 | 8.1 | 8.1 | 6.1 | −2.4 | 5.0 |
| Gross product | 84.0 | 83.6 | 100.0 | 96.5 | 110.1 | 108.1 | 105.2 | 112.5 | 111.2 | 117.1 | .5 | 3.8 | 2.4 | −1.1 | 5.3 |
| Net product | 89.4 | 86.6 | 100.0 | 94.1 | 108.2 | 104.9 | 100.4 | 107.4 | 105.5 | 111.2 | 0 | 3.0 | 1.5 | −1.8 | 5.4 |
| **Poland:** | | | | | | | | | | | | | | | |
| Expenses | 45.9 | 69.1 | 100.0 | 92.5 | 99.5 | 106.1 | 113.6 | 108.9 | 85.2 | 81.3 | 11.8 | 9.2 | 3.2 | −21.8 | −4.6 |
| Gross product | 97.0 | 93.6 | 100.0 | 102.7 | 102.0 | 109.0 | 104.6 | 94.7 | 99.1 | 95.5 | −2.3 | 1.9 | −.4 | 4.6 | −3.7 |
| Net product | 101.9 | 95.7 | 100.0 | 102.1 | 100.8 | 107.8 | 101.8 | 90.3 | 94.4 | 89.8 | −3.0 | 1.5 | −1.3 | 4.6 | −5.0 |
| **Romania:** | | | | | | | | | | | | | | | |
| Expenses | 39.4 | 59.0 | 100.0 | 103.7 | 106.2 | 105.3 | 112.7 | 124.4 | 117.2 | 124.3 | 8.2 | 11.3 | 3.9 | −5.8 | 6.1 |
| Gross product | 92.4 | 88.8 | 100.0 | 126.4 | 124.1 | 129.7 | 130.3 | 114.9 | 114.0 | 121.3 | −1.2 | 1.6 | 2.4 | −.7 | 6.3 |
| Net product | 101.3 | 92.3 | 100.0 | 129.2 | 124.3 | 129.2 | 128.6 | 108.8 | 105.7 | 112.1 | −2.6 | .8 | 1.3 | −2.9 | 6.1 |
| **Yugoslavia:** | | | | | | | | | | | | | | | |
| Expenses | 67.6 | 76.2 | 100.0 | 123.8 | 125.7 | 145.6 | 122.6 | 130.9 | 128.2 | 137.0 | 2.5 | 7.9 | 4.3 | −2.1 | 6.8 |
| Gross product | 73.6 | 85.5 | 100.0 | 106.0 | 112.8 | 106.4 | 112.4 | 112.2 | 115.7 | 123.9 | 2.6 | 3.4 | 2.0 | 3.1 | 7.2 |
| Net product | 73.9 | 85.6 | 100.0 | 105.7 | 112.4 | 105.9 | 111.8 | 111.6 | 115.1 | 123.6 | 2.6 | 3.3 | 1.9 | 3.1 | 7.4 |
| **Total, Eastern Europe:** | | | | | | | | | | | | | | | |
| Expenses | 51.4 | 72.4 | 100.0 | 103.3 | 107.0 | 114.3 | 116.7 | 122.6 | 117.0 | 118.6 | 7.7 | 7.3 | 4.2 | −4.6 | 1.4 |
| Gross product | 88.6 | 89.3 | 100.0 | 102.6 | 106.2 | 106.9 | 107.9 | 102.9 | 104.1 | 105.4 | −.4 | 2.5 | .9 | 1.2 | 1.2 |
| Net product | 93.2 | 91.6 | 100.0 | 101.8 | 104.8 | 104.9 | 105.0 | 98.7 | 99.1 | 99.5 | −1.0 | 2.0 | .1 | .4 | .4 |

[1] Preliminary.

Sources: Data in table 3 divided by acreage of agricultural land taken from statistical yearbooks of respective countries (see app. A).

TABLE 12.—COMPARISONS OF LEVELS OF OUTPUT, EXPENSES INCLUDING DEPRECIATION, GROSS AND NET PRODUCT PER HECTARE OF LAND IN AGRICULTURE

[Total Eastern Europe = 100]

| | Agricultural output | | | Crop output | | | Animal output | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1966–70 | 1976–80 | 1981–82 [1] | 1966–70 | 1976–80 | 1981–82 [1] | 1966–70 | 1976–80 | 1981–82 [1] |
| Bulgaria | 107.4 | 90.0 | 99.6 | 158.9 | 123.7 | 129.0 | 75.1 | 72.5 | 83.4 |
| Czechoslovakia | 117.6 | 115.2 | 121.0 | 83.0 | 77.9 | 80.0 | 139.4 | 134.6 | 143.7 |
| German Democratic Republic | 175.0 | 183.4 | 188.9 | 109.5 | 138.1 | 135.8 | 216.1 | 206.9 | 218.2 |
| Hungary | 105.5 | 116.8 | 126.7 | 122.8 | 137.5 | 140.8 | 94.6 | 106.0 | 118.9 |
| Poland | 113.4 | 106.3 | 92.7 | 98.1 | 89.5 | 83.8 | 123.0 | 115.0 | 97.7 |
| Romania | 68.7 | 76.5 | 75.4 | 86.7 | 95.0 | 95.4 | 57.4 | 66.9 | 64.3 |
| Yugoslavia | 67.7 | 68.8 | 74.4 | 85.8 | 85.6 | 88.8 | 56.4 | 60.1 | 66.4 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | Expenses including depreciation | | | Gross product | | | Net product | | |
| Bulgaria | 101.1 | 73.0 | 102.9 | 107.8 | 104.4 | 101.6 | 110.3 | 101.7 | 97.2 |
| Czechoslovakia | 194.6 | 141.8 | 168.9 | 93.7 | 100.3 | 93.7 | 82.1 | 97.0 | 85.5 |
| German Democratic Republic | 178.1 | 201.5 | 200.3 | 175.2 | 175.9 | 182.5 | 173.6 | 171.0 | 180.3 |
| Hungary | 101.3 | 140.1 | 149.0 | 105.9 | 102.7 | 110.7 | 107.4 | 100.8 | 110.1 |
| Poland | 112.2 | 104.6 | 80.1 | 111.6 | 105.3 | 100.3 | 113.9 | 107.4 | 102.1 |
| Romania | 73.0 | 91.4 | 95.6 | 69.9 | 70.2 | 66.4 | 66.7 | 66.3 | 60.4 |
| Yugoslavia | 30.8 | 31.2 | 30.5 | 80.0 | 87.6 | 95.9 | 84.8 | 94.6 | 107.0 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

[1] Preliminary.

Sources: Calculated from physical quantities weighted by 1978 U.S. dollars divided by hectares of agricultural land (see app. A).

### D. YIELDS OF SELECTED CROPS PER HECTARE AND YIELDS PER HEAD OF LIVESTOCK

Table 13 shows yields per hectare for wheat, rye, potatoes, and sugar beets for 1974–82. In the early 1960s the yields in all the East European countries, except the GDR and Czechoslovakia, were substantially below those in the Federal Republic of Germany. In Bulgaria, Romania, and Yugoslavia the average yields were one half or less than half of those of the German Federal Republic. In the last 20 years an effort has been made to improve the productivity of land, and in most of the East European countries yields have increased substantially. However, in the last eight years the improvement in yields slowed down considerably, and in Bulgaria (except for wheat) and Poland the yields declined. Czechoslovakia, the GDR, and Hungary still showed good progress in yields. Overall, the yields were still below those of the Federal Republic of Germany in 1980–82.

In the earlier postwar period, the yields of meat per pig were increasing steadily from low levels. However, from 1974-76 to 1980–82 these yields increased only slightly and in several countries they declined (Table 13). In the mid-1970s, milk yields per cow were still low in Romania and Yugoslavia, but they have been increasing. Hungary achieved the highest increases among the East European countries due to imports of high yielding breeding stock from the

West. Yields of eggs per hen increased in all countries from 1974-76 to 1980-82. As of 1980-82, the yields per head of livestock remained substantially lower in all East European countries than in the Federal Republic of Germany. The difference in yields, however, have been reduced among countries in recent years.

## VI. PRODUCTIVITY OF LABOR IN AGRICULTURE

### A. DECLINE IN AGRICULTURAL LABOR FORCE

The quality of agricultural labor statistics varies from country to country. The GDR's, Czechoslovak, Hungarian, and Polish labor data are more homogeneous, while those for the other East European countries are less standardized, and consequently the quality of labor units is less homogeneous.

In all of the East European countries the labor force in agriculture continued to decline substantially from 1965 to 1982. The percentage declines for different countries are given in Table 14. Bulgaria and Romania had the largest exodus of labor from agriculture (43 and 46 percent respectively), followed by Yugoslavia, the GDR, Czechoslovakia, Hungary, and Poland. The Polish agricultural labor force in 1982 accounted for over 30 percent and the Romanian and Yugoslav for 21 and 22 percent respectively of the total East European agricultural labor force. The remaining four countries together account for just over one-fourth of the total.

TABLE 13.—YIELDS PER HECTARE OF AGRICULTURAL LAND AND PER HEAD OF LIVESTOCK (PER YEAR)

| | Quintals per hectare | | | Indexes of yields per hectare 1974-76 = 100 | | |
|---|---|---|---|---|---|---|
| | 1974-76 | 1977-79 | 1980-82 [1] | 1974-76 | 1977-79 | 1980-82 [1] |
| Wheat: | | | | | | |
| Bulgaria | 36.2 | 36.4 | 43.0 | 100 | 101 | 119 |
| Czechoslovakia | 37.1 | 39.7 | 42.8 | 100 | 107 | 115 |
| German Democratic Republic | 39.7 | 43.2 | 44.6 | 100 | 109 | 112 |
| Hungary | 36.1 | 38.6 | 43.8 | 100 | 107 | 121 |
| Poland | 30.0 | 29.5 | 28.8 | 100 | 98 | 96 |
| Romania | 21.7 | 27.4 | 32.0 | 100 | 126 | 147 |
| Yugoslavia | 32.0 | 31.9 | 32.6 | 100 | 100 | 102 |
| Federal Republic of Germany | 46.1 | 46.5 | 51.5 | 100 | 101 | 112 |
| Rye: | | | | | | |
| Bulgaria | 13.9 | 13.7 | 13.8 | 100 | 99 | 99 |
| Czechoslovakia | 28.9 | 31.3 | 32.3 | 100 | 108 | 112 |
| German Democratic Republic | 27.0 | 27.6 | 29.4 | 100 | 102 | 109 |
| Hungary | 14.9 | 15.5 | 16.8 | 100 | 104 | 113 |
| Poland | 23.8 | 20.9 | 22.6 | 100 | 88 | 95 |
| Romania | 12.3 | 12.6 | 12.0 | 100 | 102 | 98 |
| Yugoslavia | 12,6 | 13.1 | 14.6 | 100 | 104 | 116 |
| Federal Republic of Germany | 35.1 | 35.8 | 38.1 | 100 | 102 | 109 |
| Potatoes: | | | | | | |
| Bulgaria | 110.1 | 108.0 | 103.5 | 100 | 98 | 94 |
| Czechoslovakia | 142.0 | 172.5 | 169.5 | 100 | 121 | 119 |
| German Democratic Republic | 152.8 | 194.9 | 187.2 | 100 | 128 | 123 |
| Hungary | 119.0 | 146.9 | 168.3 | 100 | 123 | 141 |
| Poland | 184.8 | 190.0 | 149.7 | 100 | 103 | 81 |
| Romania | 130.0 | 145.5 | 163.4 | 100 | 112 | 126 |
| Yugoslavia | 101.0 | 89.7 | 91.1 | 100 | 89 | 90 |
| Federal Republic of Germany | 286.2 | 297.0 | 287.3 | 100 | 104 | 100 |

## TABLE 13.—YIELDS PER HECTARE OF AGRICULTURAL LAND AND PER HEAD OF LIVESTOCK (PER YEAR)—Continued

| | Quintals per hectare | | | Indexes of yields per hectare 1974-76=100 | | |
|---|---|---|---|---|---|---|
| | 1974-76 | 1977-79 | 1980-82 [1] | 1974-76 | 1977-79 | 1980-82 [1] |
| Sugar beets: | | | | | | |
| Bulgaria | 295.1 | 283.0 | 255.8 | 100 | 96 | 87 |
| Czechoslovakia | 346.0 | 361.0 | 351.4 | 100 | 104 | 102 |
| German Democratic Republic | 241.8 | 290.7 | 289.4 | 100 | 120 | 120 |
| Hungary | 323.9 | 336.5 | 396.5 | 100 | 104 | 122 |
| Poland | 303.0 | 301.7 | 288.3 | 100 | 100 | 95 |
| Romania | 234.8 | 238.8 | 220.7 | 100 | 102 | 94 |
| Yugoslavia | 411.0 | 421.0 | 412.7 | 100 | 102 | 100 |
| Federal Republic of Germany | 430.0 | 476.0 | 506.3 | 100 | 111 | 118 |
| | Yields per head of livestock | | | Indexes of yields per head of livestock 1974-76=100 | | |
| Meat per pig in kilograms of live weight: | | | | | | |
| Bulgaria | 122 | 122 | 128 | 100 | 100 | 105 |
| Czechoslovakia | 130 | 131 | 132 | 100 | 101 | 102 |
| German Democratic Republic | 122 | 119 | 117 | 100 | 98 | 96 |
| Hungary | 138 | 141 | 140 | 100 | 102 | 101 |
| Poland | 109 | 118 | 113 | 100 | 108 | 104 |
| Romania | 110 | 109 | 98 | 100 | 99 | 89 |
| Yugoslavia | 126 | 128 | 125 | 100 | 102 | 99 |
| Federal Republic of Germany | 188 | 181 | 179 | 100 | 96 | 95 |
| Milk per cow in liters: | | | | | | |
| Bulgaria | 2,309 | 2,357 | 2,634 | 100 | 102 | 114 |
| Czechoslovakia | 2,807 | 2,926 | 3,094 | 100 | 104 | 110 |
| German Democratic Republic | 3,801 | 3,813 | 3,807 | 100 | 100 | 100 |
| Hungary | 2,675 | 3,168 | 3,782 | 100 | 118 | 141 |
| Poland | 2,633 | 2.728 | 2,631 | 100 | 104 | 100 |
| Romania | 1,768 | 1,953 | 1,908 | 100 | 110 | 108 |
| Yugoslavia | 1,362 | 1,484 | 1,615 | 100 | 109 | 119 |
| Federal Republic of Germany | 4,000 | 4,340 | 4,550 | 100 | 109 | 114 |
| Eggs per hen in numbers: | | | | | | |
| Bulgaria | 122 | 139 | 143 | 100 | 114 | 117 |
| Czechoslovakia | 215 | 225 | 229 | 100 | 105 | 107 |
| German Democratic Republic | 195 | 199 | 210 | 100 | 102 | 108 |
| Hungary | 120 | 144 | 139 | 100 | 120 | 116 |
| Poland | 103 | 114 | 130 | 100 | 111 | 126 |
| Romania | 139 | 154 | 160 | 100 | 111 | 115 |
| Yugoslavia | 114 | 119 | 127 | 100 | 104 | 111 |
| Federal Republic of Germany | 279 | 297 | 298 | 100 | 106 | 107 |

[1] Data for 1982 are preliminary.

Sources: Calculated from FAO yearbooks and statistical yearbooks of respective countries.

## TABLE 14.—EMPLOYMENT IN AGRICULTURE

[Indexes, 1975-100]

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 [1] | Average annual rates of change | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1965-70 | 1970-75 | 1975-80 | 1981 | 1982 [1] |
| Bulgaria | 149.0 | 123.0 | 100 | 87.3 | 86.1 | 84.9 | −3.8 | −3.8 | −2.5 | −1.4 | −1.4 |
| Czechoslovakia | 122.9 | 115.0 | 100 | 93.1 | 93.6 | 93.6 | −1.4 | −2.9 | −1.5 | .5 | 0 |
| GDR | 132.9 | 112.2 | 100 | 97.9 | 98.5 | 98.5 | −3.5 | −2.4 | −.3 | .6 | 0 |
| Hungary | 123.6 | 115.2 | 100 | 96.3 | 97.1 | 97.1 | −1.3 | −2.9 | −.7 | .8 | 0 |
| Poland | 108.8 | 107.2 | 100 | 88.7 | 89.0 | 87.9 | −.3 | −1.0 | −2.4 | .3 | −1.2 |
| Romania | 139.5 | 126.0 | 100 | 79.2 | 77.1 | 75.0 | −2.0 | −4.5 | −4.5 | −2.6 | −2.7 |

TABLE 14.—EMPLOYMENT IN AGRICULTURE—Continued

[Indexes, 1975-100]

|  | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 [1] | Average annual rates of change |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  | 1965–70 | 1970–75 | 1975–80 | 1981 | 1982 [1] |
| Yugoslavia | 121.3 | 110.6 | 100 | 90.4 | 88.6 | 86.8 | −1.8 | −2.0 | −2.0 | −2.0 | −2.0 |
| Eastern Europe | 124.8 | 114.8 | 100 | 87.9 | 87.1 | 85.8 | −1.7 | −2.6 | −2.5 | −.9 | −1.5 |

[1] Preliminary.

Sources: See app. A.

## B. GROWTH OF OUTPUT AND INPUTS PER WORKER

Concurrently with a steady decline in the agricultural labor force, output per unit of labor in agriculture increased sharply during the postwar period. Table 15 summarizes trends in the labor productivity by country and region from 1965 to 1982. Romania, Bulgaria, Hungary, Yugoslavia, and Czechoslovakia had the largest increases in output per unit of labor during this period (between 2 and 3 times); they were followed by the GDR and Poland with increases of 75 and 35 percent respectively. In Eastern Europe as a whole agricultural output per unit of labor increased by 6.7 percent annually for the 1970–75 period and 4.3 percent annually for 1975–80, while during 1981 there was a 1.1 percent decrease and in 1982 a 2.2 percent increase.

The increases in inputs per worker in agriculture were very impressive in all countries. The most dramatic increases occurred in Bulgaria and Romania, with a 6.9- and a 5.9-fold rise, respectively, from 1965 to 1982. In descending order, other increases were Hungary (3.4-fold), Czechoslovakia, Yugoslavia, the GDR, and Poland (2.8-, 2.7-, 2.7-, and 2.1-fold, respectively).

TABLE 15.—GROWTH OF AGRICULTURAL OUTPUT, EXPENSES INCLUDING DEPRECIATION, GROSS AND NET PRODUCT PER PERSON EMPLOYED IN AGRICULTURE

| | Indexes, 1975=100 | | | | | | | | | | Average annual rates of change | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 [1] | 1965-70 | 1970-75 | 1975-80 | 1981 | 1982 [1] |
| Bulgaria: | | | | | | | | | | | | | | | |
| Output | 55.5 | 73.7 | 100.0 | 109.2 | 107.0 | 116.6 | 123.1 | 121.3 | 129.9 | 137.7 | 5.1 | 5.7 | 4.1 | 7.1 | 6.0 |
| Expenses | 38.7 | 73.9 | 100.0 | 112.7 | 147.6 | 177.9 | 171.1 | 234.8 | 251.7 | 268.1 | 13.7 | 5.9 | 17.7 | 7.2 | 6.6 |
| Gross product | 60.6 | 72.1 | 100.0 | 108.8 | 99.4 | 103.8 | 113.7 | 96.1 | 103.2 | 109.5 | 2.6 | 6.1 | −.1 | 7.4 | 6.1 |
| Net product | 64.4 | 73.6 | 100.0 | 108.2 | 95.1 | 98.7 | 109.0 | 88.0 | 94.2 | 99.4 | 1.8 | 5.6 | −1.6 | 7.0 | 5.6 |
| Czechoslovakia: | | | | | | | | | | | | | | | |
| Output | 59.4 | 76.2 | 100.0 | 100.1 | 109.7 | 113.4 | 112.4 | 117.7 | 115.9 | 114.4 | 4.6 | 6.2 | 3.5 | −1.6 | −1.3 |
| Expenses | 52.0 | 73.2 | 100.0 | 106.6 | 109.0 | 121.6 | 124.2 | 128.2 | 146.7 | 144.7 | 5.9 | 7.2 | 5.3 | 14.4 | −1.3 |
| Gross product | 68.3 | 78.1 | 100.0 | 96.1 | 111.7 | 109.5 | 107.2 | 113.6 | 99.0 | 99.9 | 3.0 | 5.5 | 2.7 | −12.8 | .9 |
| Net product | 71.3 | 80.9 | 100.0 | 94.3 | 110.4 | 106.1 | 101.9 | 108.4 | 88.5 | 87.5 | 2.9 | 4.8 | 1.7 | −18.3 | −1.2 |
| German Democratic Republic: | | | | | | | | | | | | | | | |
| Output | 60.1 | 75.6 | 100.0 | 101.8 | 105.9 | 105.6 | 108.2 | 109.5 | 110.5 | 105.4 | 4.6 | 6.1 | 1.8 | .9 | −4.6 |
| Expenses | 44.6 | 68.7 | 100.0 | 117.7 | 110.5 | 115.6 | 113.6 | 119.2 | 118.9 | 118.3 | 8.3 | 7.3 | 2.4 | −.3 | −.5 |
| Gross product | 69.7 | 81.5 | 100.0 | 93.0 | 104.4 | 101.3 | 106.8 | 105.8 | 107.9 | 101.2 | 3.3 | 5.2 | 1.9 | 2.0 | −6.2 |
| Net product | 74.6 | 84.7 | 100.0 | 90.7 | 102.8 | 98.6 | 104.3 | 102.8 | 104.7 | 96.3 | 2.8 | 4.5 | 1.5 | 1.9 | −8.0 |
| Hungary: | | | | | | | | | | | | | | | |
| Output | 59.0 | 69.3 | 100.0 | 99.8 | 113.7 | 116.6 | 114.1 | 120.2 | 116.3 | 121.9 | 3.7 | 7.9 | 3.9 | −3.3 | 4.8 |
| Expenses | 39.2 | 60.2 | 100.0 | 104.0 | 115.7 | 126.1 | 127.9 | 133.5 | 128.8 | 134.7 | 9.3 | 11.0 | 6.3 | −3.5 | 4.6 |
| Gross product | 69.8 | 73.7 | 100.0 | 98.8 | 114.0 | 112.0 | 107.6 | 114.3 | 111.7 | 117.2 | 1.6 | 6.5 | 2.6 | −2.3 | 4.9 |
| Net product | 74.3 | 76.3 | 100.0 | 96.4 | 112.0 | 108.7 | 102.6 | 109.2 | 106.0 | 111.3 | 1.1 | 5.7 | 1.7 | −3.0 | 5.0 |
| Poland: | | | | | | | | | | | | | | | |
| Output | 71.4 | 79.1 | 100.0 | 100.0 | 103.8 | 112.9 | 115.7 | 108.6 | 100.5 | 96.7 | 1.7 | 5.2 | 2.7 | −7.4 | −3.8 |
| Expenses | 43.1 | 65.5 | 100.0 | 94.1 | 103.0 | 111.8 | 123.5 | 121.1 | 94.3 | 90.9 | 12.0 | 9.9 | 5.4 | −22.2 | −3.6 |
| Gross product | 91.1 | 88.8 | 100.0 | 104.4 | 105.6 | 114.9 | 113.6 | 105.4 | 109.7 | 106.8 | −2.1 | 2.5 | 1.7 | 4.1 | −2.7 |
| Net product | 95.7 | 90.8 | 100.0 | 103.8 | 104.3 | 113.6 | 110.6 | 100.5 | 104.5 | 100.3 | −2.8 | 2.1 | .9 | 4.0 | −4.0 |
| Romania: | | | | | | | | | | | | | | | |
| Output | 49.3 | 59.6 | 100.0 | 122.0 | 126.0 | 133.6 | 145.3 | 147.6 | 144.8 | 157.7 | 3.3 | 10.5 | 7.5 | −1.9 | 8.9 |
| Expenses | 28.0 | 46.8 | 100.0 | 109.0 | 116.4 | 120.4 | 136.0 | 157.2 | 152.1 | 165.6 | 10.7 | 16.6 | 8.8 | −3.2 | 8.9 |
| Gross product | 65.5 | 70.4 | 100.0 | 132.7 | 136.0 | 148.2 | 157.2 | 145.1 | 148.0 | 161.6 | 1.1 | 6.4 | 7.3 | 2.0 | 9.2 |
| Net product | 71.9 | 73.2 | 100.0 | 135.7 | 136.2 | 147.7 | 155.2 | 137.5 | 137.1 | 149.3 | −.3 | 5.6 | 6.1 | −.3 | 8.9 |
| Yugoslavia: | | | | | | | | | | | | | | | |
| Output | 61.4 | 77.2 | 100.0 | 110.3 | 118.4 | 118.0 | 121.9 | 126.0 | 131.3 | 143.8 | 4.3 | 5.9 | 4.2 | 4.2 | 9.5 |
| Expenses | 57.1 | 70.0 | 100.0 | 125.8 | 129.8 | 153.0 | 131.7 | 143.9 | 143.7 | 156.7 | 4.2 | 9.8 | 6.2 | −.1 | 9.0 |
| Gross product | 62.1 | 78.5 | 100.0 | 107.6 | 116.5 | 111.8 | 120.7 | 123.2 | 129.7 | 141.8 | 4.4 | 5.2 | 3.9 | 5.2 | 9.3 |
| Net product | 62.3 | 78.6 | 100.0 | 107.3 | 116.2 | 111.3 | 120.1 | 122.6 | 129.0 | 141.3 | 4.3 | 5.1 | 3.8 | 5.2 | 9.6 |
| Total, Eastern Europe: | | | | | | | | | | | | | | | |
| Output | 60.7 | 73.0 | 100.0 | 105.5 | 111.6 | 117.1 | 121.2 | 122.1 | 120.8 | 123.4 | 3.4 | 6.7 | 4.3 | −1.1 | 2.2 |
| Expenses | 41.7 | 63.7 | 100.0 | 106.4 | 113.0 | 123.4 | 129.1 | 138.7 | 133.3 | 137.0 | 9.5 | 9.9 | 6.8 | −3.9 | 2.8 |
| Gross product | 71.8 | 78.6 | 100.0 | 105.8 | 112.1 | 115.4 | 119.4 | 116.3 | 118.6 | 121.7 | 1.2 | 5.0 | 3.3 | 2.0 | 2.6 |
| Net product | 75.6 | 80.6 | 100.0 | 105.0 | 110.7 | 113.2 | 116.2 | 111.7 | 112.9 | 114.9 | .6 | 4.5 | 2.5 | 1.1 | 1.8 |

[1] Preliminary.

Source: Data in table 3 divided by the indexes of agricultural employment of respective countries given in table 15 (see appendix A).

The increases in gross and net product per unit of labor in descending order ranked as follows: Romania, Yugoslavia, Hungary, Bulgaria, the GDR, Czechoslovakia and Poland. On the whole the East European performance per unit of labor has been impressive. It reflects largely the reduction of extensive disguised agricultural unemployment by transfers of labor to non-agricultural sectors of the economy, permitting better overall use of available labor resources.

### C. LEVELS OF OUTPUT AND INPUTS PER WORKER

Comparative levels of productivity of labor among the different countries in relation to the East European average are shown in Table 16. Very large differences in productivity of labor continue to exist among the individual countries. As of 1980-82, the Yugoslav and Romanian worker still produced only about one-fourth and the Polish worker 29 percent of the GDR output per worker. Czechoslovakia has been the second highest in output per worker, followed by Hungary, Bulgaria, Poland, Romania, and Yugoslavia on a rapidly descending scale. The difference in relative levels of inputs per worker have been even greater. Relative levels of gross and net product per worker were approximately of the same order of magnitude as in the case of output.

## VII. Progress in Agricultural Technology

### A. PROGRESS IN MECHANIZATION

A widely used indicator of the extent of mechanization is the number of tractors or amount of tractor horsepower per unit of land and per unit of labor. Table 17 presents amount of available tractor horsepower per 1,000 hectares of agricultural land and per 1,000 workers in agriculture by country and major regions. Our findings show that in the 1979-82 period the extent of the use of mechanical power was still low, by West European standards, in most of the East European countries. Only in Czechoslovakia and the GDR were close to West European levels. However, the level of West European mechanization was, in turn, low in comparison to that of the United States, where the amount of tractor horsepower per 1,000 full-time workers in agriculture was 81,253 in 1981-82.[9]

TABLE 16.—COMPARISONS OF LEVELS OF OUTPUT, EXPENSES INCLUDING DEPRECIATION, GROSS AND NET PRODUCT PER PERSON EMPLOYED IN AGRICULTURE

[Eastern Europe-100]

| | Agricultural output | | | Expenses including depreciation | | | Gross product | | | Net product | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] | 1966-70 | 1976-80 | 1981-82 [1] |
| Bulgaria | 104.1 | 106.3 | 116.6 | 98.6 | 86.6 | 120.5 | 104.3 | 123.2 | 118.9 | 106.7 | 119.9 | 113.7 |
| Czechoslovakia | 180.4 | 168.5 | 165.9 | 297.8 | 207.2 | 231.5 | 143.8 | 146.7 | 128.5 | 126.0 | 141.9 | 117.1 |
| German Democratic Republic | 280.0 | 282.0 | 271.1 | 285.0 | 309.4 | 287.5 | 280.2 | 270.6 | 262.1 | 277.6 | 263.1 | 258.9 |
| Hungary | 155.1 | 161.7 | 161.5 | 148.8 | 193.7 | 190.0 | 155.8 | 142.3 | 141.1 | 158.0 | 139.8 | 140.3 |
| Poland | 110.3 | 91.0 | 78.4 | 108.9 | 89.6 | 67.7 | 108.6 | 90.1 | 84.8 | 110.9 | 91.9 | 86.3 |

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[9] U.S. Dept. of Agriculture, Agricultural Statistics 1982, op. cit., p. 395, and Survey of Current Business, No. 8, 1983, p. S-9.

TABLE 16.—COMPARISONS OF LEVELS OF OUTPUT, EXPENSES INCLUDING DEPRECIATION, GROSS AND NET PRODUCT PER PERSON EMPLOYED IN AGRICULTURE—Continued

[Eastern Europe-100]

| | Agricultural output | | | Expenses including depreciation | | | Gross product | | | Net product | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1966–70 | 1976–80 | 1981–82 [1] | 1966–70 | 1976–80 | 1981–82 [1] | 1966–70 | 1976–80 | 1981–82 [1] | 1965–70 | 1976–80 | 1981–82 [1] |
| Romania | 51.0 | 68.5 | 72.6 | 54.3 | 82.0 | 92.1 | 51.9 | 62.7 | 64.0 | 49.5 | 59.2 | 58.2 |
| Yugoslavia | 62.9 | 59.5 | 65.1 | 28.5 | 26.9 | 26.7 | 74.4 | 75.8 | 84.0 | 78.8 | 81.9 | 93.7 |
| Total, Eastern Europe | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

[1] Preliminary.

Sources: Calculated from physical quantities weighted by 1978 U.S. dollars divided by the number of employed in agriculture taken from statistical yearbooks of respective countries. (See appendix A.)

TABLE 17.—TRACTOR HORSEPOWER PER 1,000 HECTARES OF AGRICULTURAL LAND AND PER 1,000 WORKERS IN AGRICULTURE

| | Amount of tractor horsepower | | | Eastern Europe=100 | | | Indexes | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1973–76 | 1976–79 | 1979–82 [1] | 1973–76 | 1976–79 | 1979–82 [1] | 1973–76 | 1976–79 | 1979–82 [1] |
| Bulgaria: | | | | | | | | | |
| Per 1,000 hectares | 534 | 602 | 632 | 82 | 75 | 64 | 100 | 113 | 118 |
| Per 1,000 workers | 2,646 | 3,462 | 3,795 | 91 | 88 | 74 | 100 | 131 | 143 |
| Czechoslovakia: | | | | | | | | | |
| Per 1,000 hectares | 1,059 | 1,183 | 1,267 | 163 | 147 | 128 | 100 | 112 | 120 |
| Per 1,000 workers | 7,220 | 8,463 | 9,103 | 249 | 216 | 178 | 100 | 117 | 126 |
| German Democratic Republic: | | | | | | | | | |
| Per 1,000 hectares | 1,155 | 1,312 | 1,514 | 178 | 163 | 153 | 100 | 114 | 131 |
| Per 1,000 workers | 8,503 | 9,894 | 11,349 | 293 | 253 | 223 | 100 | 116 | 133 |
| Hungary: | | | | | | | | | |
| Per 1,000 hectares | 520 | 572 | 637 | 80 | 71 | 64 | 100 | 110 | 123 |
| Per 1,000 workers | 3,398 | 3,892 | 4,259 | 117 | 99 | 84 | 100 | 115 | 125 |
| Poland: | | | | | | | | | |
| Per 1,000 hectares | 724 | 1,001 | 1,418 | 111 | 124 | 143 | 100 | 138 | 196 |
| Per 1,000 workers | 2,799 | 4,160 | 6,205 | 97 | 106 | 122 | 100 | 149 | 222 |
| Romania: | | | | | | | | | |
| Per 1,000 hectares | 496 | 571 | 634 | 76 | 71 | 64 | 100 | 115 | 128 |
| Per 1,000 workers | 1,854 | 2,448 | 3,083 | 64 | 62 | 60 | 100 | 132 | 166 |
| Yugoslavia: | | | | | | | | | |
| Per 1,000 hectares | 397 | 592 | 763 | 61 | 73 | 77 | 100 | 149 | 192 |
| Per 1,000 workers | 1,587 | 2,489 | 3,409 | 55 | 64 | 67 | 100 | 157 | 215 |
| Total, Eastern Europe: | | | | | | | | | |
| Per 1,000 hectares | 649 | 807 | 992 | 100 | 100 | 100 | 100 | 124 | 153 |
| Per 1,000 workers | 2,900 | 3,917 | 5,100 | 100 | 100 | 100 | 100 | 135 | 176 |
| Western Europe: | | | | | | | | | |
| Per 1,000 hectares | 1,357 | 1,601 | 1,885 | 209 | 198 | 190 | 100 | 118 | 139 |
| Per 1,000 workers | 11,740 | 15,017 | 19,400 | 405 | 383 | 380 | 100 | 128 | 165 |

[1] Data for 1982 are preliminary.

Sources: Calculated from statistical yearbooks of respective CMEA countries and FAO yearbooks and monthly statistical bulletins.

Progress in mechanization has continued to gain momentum. In most East European countries the rates of increase were high; in fact the percentage increases exceeded those of Western Europe. By the 1979–82 period, Czechoslovakia and the GDR had more than three times as much tractor horsepower per worker as Romania. Here it is not only the quantity of capital that is decisive in the rate of progress in mechanization but also the quality and the effectiveness of its use. There is ample evidence that the productivity of machinery in agriculture has been declining, especially in

Czechoslovakia and Bulgaria, due to the excessive age of tractors and machines and their inefficient use (see more detailed discussions in individual country contributions to this series of volumes by Cochrane, Cook, Cummings, and Vankai). Polish and Yugoslav progress in mechanization was particularly rapid in the last 10 years. The differences in relative levels of mechanization between the East European countries narrowed from 1973 to 1982.

Western Europe has nonetheless retained its lead in mechanization over Eastern Europe. In 1979–82, Western Europe still had almost four times as much tractor horsepower per worker as Eastern Europe. Hence, there is still plenty of room for further improvement toward the West European level.

### B. GROWTH OF FERTILIZER CONSUMPTION

Most of the East European countries made rapid progress toward increased use of fertilizers in recent years. Table 18 shows that by 1979–82, consumption of fertilizers per unit of land was exceeding the West European level in Czechoslovakia, the GDR, and Hungary. Bulgarian and Polish consumption per hectare were getting close to the level of Western Europe, and they were at about the average for Eastern Europe in the same period. Czechoslovakia, the GDR, and Hungary exceeded the East European consumption level by 58, 72, and 43 percent, respectively, in the 1979–82 period. Poland achieved an average level of 186 kilograms per hectare, or close to the 210 kilograms in Western Europe, while Romania and Yugoslavia remained the lowest users with 91 and 65 kilograms per hectare annually in the same period. The heavily increased application of fertilizers already has paid off with significantly increased yields in Eastern Europe.

TABLE 18.—CONSUMPTION OF COMMERCIAL FERTILIZERS PER HECTARE OF AGRICULTURAL LAND

| | Pure nutrients [1] in kilograms per hectare | | | Eastern Europe = 100 | | | Indexes of fertilizer consumption per hectare (1973–76 = 100) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1973–76 | 1976–79 | 1979–82 [2] | 1973–76 | 1976–79 | 1979–82 [2] | 1973–76 | 1976–79 | 1979–82 |
| Bulgaria | 105 | 119 | 151 | 75 | 78 | 97 | 100 | 113 | 144 |
| Czechoslovakia | 218 | 244 | 248 | 156 | 160 | 158 | 100 | 112 | 113 |
| German Democratic Republic | 287 | 273 | 270 | 205 | 179 | 172 | 100 | 95 | 94 |
| Hungary | 201 | 221 | 225 | 143 | 145 | 144 | 100 | 110 | 112 |
| Poland | 176 | 189 | 186 | 126 | 124 | 118 | 100 | 108 | 106 |
| Romania | 63 | 87 | 91 | 49 | 57 | 58 | 100 | 126 | 132 |
| Yugoslavia | 49 | 57 | 65 | 35 | 37 | 41 | 100 | 116 | 132 |
| Total, Eastern Europe | 140 | 152 | 157 | 100 | 100 | 100 | 100 | 109 | 112 |
| Western Europe | 176 | 197 | 210 | 126 | 130 | 134 | 100 | 112 | 119 |

[1] Nitrogen (N), phosphate ($P_2O_5$), and potash ($K_2O$).

[2] Data for 1982 are preliminary.

Sources: Calculated from statistical yearbooks of respective CMEA countries and FAO yearbooks and monthly statistical bulletins, assuming commensurability of the pure nutrients per kilogram.

### C. SCIENTIFIC METHODS ON THE FARM

The adoption of high-yielding crop varieties and livestock breeds helped to increase yields per unit of input in all the East European countries. Research on improvement of seeds has been stepped up by the agricultural research institutes, partly under the coordination of the CMEA (Council for Mutual Economic Aid) Permanent Commission on Agriculture. A significant increase in grain yields has been attributed to the introduction of improved hard wheat varieties, hybrid varieties of corn and better strains of barley, rye, and oats. The development of improved breeds of livestock has contributed to increased yields of milk per cow, eggs per hen, higher dressing rates of livestock, leaner types of animals, and higher daily gains in live weight for all livestock. New breeds of livestock are being imported from Western Europe and the USA, especially by Hungary and Yugoslavia.

Irrigation and drainage of agricultural land on a large scale is increasing the productivity of land in all East European countries. Technological knowledge has been disseminated through rapidly increasing numbers of agricultural technical institutes and agricultural colleges. The recent development in Eastern Europe of agro-industrial complexes is increasing the overall efficiency of labor use through local processing of agricultural products, employing seasonally idle agricultural labor, and diffusing technical knowledge in rural areas.[10]

### D. INVESTMENT IN AGRICULTURE

The recent growth of gross fixed agricultural investment and its share in total investment in Eastern Europe is shown in Table 19. These investment series should be interpreted with care, assuming a considerable margin of error, because for some of these countries, not enough is known about the prices of investment goods and the content of the investment total (it includes, for example, some military procurements), and the terms of measurement vary from country to country. Yet, despite their shortcomings, these series indicate general trends in recent years.

Throughout Eastern Europe there has been a substantial increase in agricultural investment, generally with less developed countries showing the greatest growth: Romania, Yugoslavia, Poland, Hungary, and Bulgaria experiencing high increases in investment in the 1966–70 and 1971–75 periods. However, for 1976–80, increases in investment were smaller. In 1981 there was a decrease in Poland and in 1982 substantial decreases in all other countries for which data are available.

Agricultural investments may be usefully related to total investment and compared with agricultural's share in total GNP. These relationships are shown in Table 19 and in Table 1. Agriculture's share in total investment was relatively low, from 9 to 17 percent, depending on the country, in the 1966–70 period. At the same time, the contribution of agriculture to the total GNP was over two times as large as the investment share in Romania, Bulgaria, and Yugoslavia, almost two times as large in Poland, about 59 percent larger in Hungary and Czechoslovakia, and 11 percent larger in the GDR.

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[10] See Zemedelska ekonomika, 1983, No. 7, pp. 495–496.

TABLE 19.—GROSS FIXED AGRICULTURAL INVESTMENT AND ITS SHARE IN TOTAL INVESTMENT

| | Indexes of gross fixed agricultural investment (preceding period = 100) | | | | | Agriculture's share in total investment (in percent) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1966–70 | 1971–75 | 1976–80 | 1981 | 1982 | 1966–70 | 1971–75 | 1976–80 | 1981 | 1982 |
| Bulgaria [1] | 139 | 135 | 124 | 116 | 81 | 16.1 | 15.3 | 13.3 | 12.4 | 10.7 |
| Czechoslovakia [2] | 103 | 139 | 131 | 106 | 98 | 11.1 | 10.8 | 10.6 | 10.9 | 11.0 |
| German Democratic Republic [3] | 162 | 121 | 109 | 103 | 91 | 14.1 | 12.2 | 10.4 | 9.8 | 9.5 |
| Hungary [4] | 182 | 143 | 104 | NA | NA | 15.9 | 14.5 | 11.2 | 14.3 | 15.1 |
| Poland [5] | 170 | 165 | 146 | 87 | 88 | 17.4 | 15.2 | 16.2 | 18.6 | 18.4 |
| Romania [6] | 153 | 149 | 154 | 110 | NA | 15.5 | 14.0 | 13.4 | 15.4 | NA |
| Yugoslavia [7] | 152 | 162 | 129 | NA | NA | 9.2 | 9.3 | 9.1 | NA | NA |

[1] State and collective farms' investment in leva at 1962 and 1971 prices.

[2] Total investment in agriculture in crowns, 1966–75 at 1967 prices; 1976–82 at 1977 prices.

[3] Agriculture includes forestry, investment in marks, 1966–75 at 1967 prices; 1976–82 at 1975 prices.

[4] Investment in forints, 1966–75 at 1968 prices, 1976–80 at 1976 prices, 1981–82 at current prices.

[5] Investment in zlotys, 1966–75 at 1971 prices; 1976–82 at 1977 prices.

[6] Investment in lei, 1966–75 at 1963 prices; 1976–81 at 1977 prices.

[7] Investment including private farming, 1966–75 in dinars; 1976–80 is an estimate.

Source: Calculated from statistical yearbooks of repective countries, of CMEA, and "National Accounts of OECD Countries," OECD, Paris, 1983 (see app. A).

In the subsequent years agriculture's share in total investment in general declined. However, the difference between agriculture's share in total investment and its share in GNP also shrank in most countries. In the less industrialized countries, Bulgaria, Yugoslavia, and Romania, the ratios of agricultural investment shares to their GNP shares are between 0.46 and 0.58. This would seem to sugget that agriculture is partly financing industrialization in these countries. In the final analysis, the ratio reflects governmental price and taxing polices towards agriculture.

It is to be noted that the Soviet Union allocated 27 percent of total investment to agriculture in the 1976–82 period.[11] This is a much higher percentage than in any other East European country for the same period. In the USSR, agriculture's share in total GNP was only 13.9 percent in 1980.[12]

## VIII. COMBINED FACTOR PRODUCTIVITY IN AGRICULTURE

### A. GROWTH OF NON-LABOR INPUTS

Non-labor inputs into agriculture consist of three categories: current operating expenses and depreciation, agricultural land, and capital. Expenses and depreciation represent all goods and services bought by the agricultural sector from non-agricultural sectors and used up in production, along with depreciation charges. Indexes based on constant prices are presented in Table 3. Agricultural land as an input has been discussed in Section V–A, above. Capital input is represented by the stock of fixed capital as officially given. For the 1965–75 period, these three input series were combined into a single non-labor input by 1967–69 (depending on country) adjusted factor cost weights;[13] for the 1975–82 period, they were combined by 1975-1977 (depending on country) adjusted factor cost weights.[14] The two combined series were linked at 1975 to obtain one continuous measure of non-labor input for each country.

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[11] Narodnoe khoziaistvo 1982, pp. 372 and 376, *Pravda*, Jan. 23, 1983.

[12] US Congress, Joint Economic Committee, "USSR: Measures of Economic Growth and Development, 1950–1980" 1982, p. 61.

[13] OP-48, pp. 8, 20, 26, 31, 37, and 46, and OP-62, pp. 30–62.

Combined non-labor inputs grew very rapidly for most countries from 1965 to 1982. The percentage increases were as follows: Bulgaria 144, Czechoslovakia 86, the GDR 81, Hungary 122, Poland 67, and Yugoslavia 43. For Romania no estimates were made, due to lack of reliable capital data. The percentage of non-labor inputs in the total for 1975-77 (depending on country) ranged from a 45 percent low for Bulgaria to a 75 percent high for Czechoslovakia. Labor input accounted for the balance of the total inputs.

### B. COMBINED FACTOR PRODUCTIVITY

Having output, labor input, and estimated non-labor input indexes, we calculated the combined factor productivity in agriculture using a Cobb-Douglas production function.[15] Table 20 presents the combined factor productivity for the six East European countries individually and for the whole of Eastern Europe (excluding Romania, for which reliable data were not available) for the period 1965-82.

The results show that in all countries except Poland, combined factor productivity was increasing at a rate of about one percent or more annually, on the average, from 1965 to 1975. In Yugoslavia, however, the average compound rate of growth was over 2 percent while in Poland factor productivity decreased slightly in the same period. In Eastern Europe as a whole, combined factor productivity increased 11 percent between 1965 to 1975. This favorable progress could be explained by the positive effects of several "non-measurable" factors, such as improved technology, more efficient organization of production and better allocation of inputs, and above all, improved personal incentives to farmers via improved prices, incomes, and decentralization of decision making.

TABLE 20.—COMBINED FACTOR PRODUCTIVITY, 1965-82

[Indexes are 3-year moving averages, 1965-67 = 100]

| | (1) Bulgaria | (2) Czechoslovakia | (3) German Democratic Republic | (4) Hungary | (5) Poland | (6) Yugoslavia | (7) Eastern Europe |
|---|---|---|---|---|---|---|---|
| 1965-67 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1967 | 101 | 104 | 103 | 103 | 102 | 104 | 103 |
| 1968 | 100 | 105 | 104 | 106 | 98 | 107 | 104 |
| 1969 | 100 | 106 | 102 | 103 | 94 | 106 | 103 |
| 1970 | 102 | 105 | 100 | 104 | 92 | 109 | 103 |
| 1971 | 105 | 106 | 101 | 103 | 95 | 109 | 104 |
| 1972 | 107 | 108 | 103 | 108 | 98 | 114 | 107 |
| 1973 | 107 | 111 | 107 | 111 | 99 | 119 | 109 |
| 1974 | 110 | 112 | 108 | 113 | 98 | 123 | 112 |
| 1975 | 113 | 111 | 106 | 111 | 95 | 127 | 111 |
| 1976 | 114 | 112 | 107 | 111 | 93 | 131 | 111 |
| 1977 | 114 | 113 | 106 | 112 | 94 | 134 | 112 |
| 1978 | 114 | 113 | 107 | 114 | 93 | 136 | 113 |

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[14] OP-64, pp. 4-12, OP-76, pp. 34-60, and OP-79, p. 26.

[15] For explanation of this function, see sources to Table 20.

TABLE 20.—COMBINED FACTOR PRODUCTIVITY, 1965–82—Continued

[Indexes are 3-year moving averages, 1965–67 = 100]

| | (1) Bulgaria | (2) Czechoslovakia | (3) German Democratic Republic | (4) Hungary | (5) Poland | (6) Yugoslavia | (7) Eastern Europe |
|---|---|---|---|---|---|---|---|
| 1979 | 114 | 112 | 106 | 114 | 90 | 137 | 112 |
| 1980 | 114 | 110 | 107 | 113 | 85 | 141 | 112 |
| 1981 | 114 | 109 | 105 | 115 | 82 | 145 | 112 |
| 1981–82 | 116 | 107 | 104 | 115 | 82 | 149 | 112 |

Source: Combined factor productivity was calculated by Cobb-Douglas production function of the form Output = $AL^{a}K^{1-a}$, where L represents the labor input index, K the non-labor (capital, land and expenses) input index, a the percentage share of returns to labor in total output, (1-a) distributed to non-labor factors of production valued at adjusted factor cost, and A the combined factor productivity.

For output, labor input, and operating expense indexes, see OP–62 and OP–76; for agricultural land and fixed capital indexes, see statistical yearbooks of respective countries. The percentage shares of labor and non-labor inputs in total output in 1967–69 period (depending on country) were estimated from OP–48 and OP–62; these shares were used to calculate the factor productivity for 1965–1975 period. The percentage shares of labor and non-labor inputs in total output in 1975–1977 period (depending on country) were estimated from OP–64 and OP–76; these shares were used to calculate the factor productivity for 1976–1982 period. These two indexes were linked at 1975 to obtain one consistent series.

From 1975 to 1982, factor productivity increased rapidly only in Yugoslavia, by about 17 percent, while in Bulgaria and Hungary it rose only marginally, by about 3 percent. In the other three countries factor productivity decreased noticeably after 1975: in Czechoslovakia by 4 percent, in the GDR by 4 percent, and Poland by 14 percent, making Poland the country showing the poorest performance over the whole period under study. For the region as a whole there was no improvement in factor productivity in the last eight years. The main reasons for lagging factor productivity were a slowdown in the application of new technology on farms, a sharp decrease in imports of feed and other inputs due to hard foreign exchange shortages, increases in the cost of fuel and other inputs, and a certain degree of recentralization in management and a consequent decrease in personal incentives to farmers. Last but not least, the adverse weather conditions in most East European countries during the last several years also contributed negatively to factor productivity.

## IX. SIZE COMPARISONS OF OUTPUT BETWEEN EASTERN EUROPE, U.S.S.R., WESTERN EUROPE, AND UNITED STATES OF AMERICA

In this section we summarize our findings as to the comparative size of agricultural output in Eastern Europe, the USSR, Western Europe, the USA, and individual countries for selected periods in terms of international wheat units (Table 21). (Output is defined here as final use output.)

TABLE 21.—COMPARISONS OF LEVELS OF AGRICULTURAL OUTPUT AND AGRICULTURAL OUTPUT PER CAPITA: EAST EUROPEAN COUNTRIES, U.S.S.R., WESTERN EUROPE, AND UNITED STATES

[In percent, United States = 100]

| | Total agricultural output | | | | Agricultural output per capita | | | |
|---|---|---|---|---|---|---|---|---|
| | 1966–70 | 1971–75 | 1976–80 | 1981–82 [1] | 1966–70 | 1971–75 | 1976–80 | 1981–82 [1] |
| Bulgaria | 3.3 | 3.2 | 3.0 | 2.8 | 78.7 | 76.2 | 74.6 | 73.6 |
| Czechoslovakia | 4.2 | 4.4 | 4.2 | 3.7 | 58.8 | 62.9 | 61.7 | 56.3 |
| German Democratic Republic | 5.6 | 5.7 | 5.3 | 5.2 | 66.1 | 70.3 | 70.8 | 71.5 |
| Hungary | 4.2 | 4.5 | 4.4 | 4.1 | 81.4 | 91.1 | 92.0 | 87.7 |
| Poland | 10.6 | 10.7 | 9.7 | 7.8 | 65.8 | 67.2 | 61.6 | 49.6 |

TABLE 21.—COMPARISONS OF LEVELS OF AGRICULTURAL OUTPUT AND AGRICULTURAL OUTPUT PER CAPITA: EAST EUROPEAN COUNTRIES, U.S.S.R., WESTERN EUROPE, AND UNITED STATES—Continued

[In percent, United States = 100]

| | Total agricultural output | | | | Agricultural output per capita | | | |
|---|---|---|---|---|---|---|---|---|
| | 1966-70 | 1971-75 | 1976-80 | 1981-82 [1] | 1966-70 | 1971-75 | 1976-80 | 1981-82 [1] |
| Romania | 5.5 | 5.9 | 6.5 | 5.7 | 55.5 | 59.2 | 66.8 | 58.7 |
| Yugoslavia | 5.3 | 5.3 | 5.3 | 5.1 | 53.2 | 53.7 | 53.5 | 51.8 |
| East European | 38.6 | 39.6 | 38.4 | 34.4 | 63.5 | 66.1 | 65.7 | 59.9 |
| U.S.S.R. | 74.9 | 74.3 | 69.3 | 59.5 | 63.1 | 62.6 | 59.1 | 51.2 |
| Western Europe | 86.3 | 86.0 | 79.8 | 75.7 | 52.7 | 53.3 | 51.2 | 49.9 |
| United States | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

[1] Preliminary.

Sources: Calulated for Eastern Europe and the Soviet Union from physical quantities weighted by FAO Eastern European and Soviet Union wheat-based priced relatives for the 1961-65 period; for Western Europe, the Western European FAO wheat-based price relatives for the 1961-65 period were used as weights, and for the United States, the North American FAO wheat-based price relatives for the 1961-65 period were used as weights. Physical quantities and population data were taken from statistical yearbooks of the respective countries. The FAO wheat-based price relative for the 1961-65 period were taken from: United Nations, Food and Agricultural Organization, "Production Yearbook, 1975," Rome, 1976, pp. 470-471, and FAO, "Monthly Bulletin of Statistics," 1983, No. 7-8, pp. 10-11.

From 1966-70 to 1971-75 agricultural output of most East European countries and of Eastern Europe as a whole in comparison to the USA increased somewhat, because of slightly lower rates of increases in the USA. The USSR and West European magnitudes, however, declined slightly in relation to that of the USA. In the 1976-80 and 1981-82 periods, the output of all countries, except Romania for 1976-80, decreased in comparison with the USA. East European agricultural output relative to that of the USA declined from 39.6 percent in 1971-75 to 38.4 percent in 1976-80 and further to 34.4 percent in 1981-82, that of the USSR from 74.3 to 69.3 and 59.5 percent, respectively, and that of Western Europe from 86 to 79.8 and 75.7 percent, respectively.

In the USA output increased faster than in the other countries during the second half of the 1970s and early 1980s. Other authors show similar relative sizes of the US and USSR outputs (USSR as percent of USA 76.8 in 1971-75, and 74.7 in 1975-77 when both are valued in 1968 ruble prices).[16]

International comparisons of output per capita provide better measures of relative self-sufficiency than comparisons of total agricultural output. The agricultural output of the USSR and that of Eastern Europe is not sufficient in providing an adequate food supply to that region's population, while the United States' agricultural output meets domestic needs for a high level of nutrition and provides a surplus for export. Hence a comparison of the per capita levels of agricultural output in terms of the US per capita output will provide a rough measure of the degree of "self-sufficiency." We may define "self-sufficiency" assuming that the U.S. level of per capita output is about 25 percent above the norm of an adequate food supply.[17] The per capita levels of agricultural output in different countries in terms of the USA=100 for 1966-70, 1971-75, 1976-80, and 1981-82 are given in Table 21.

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[16] See Douglas B. Diamond with W. Lee Davis, "Comparative Growth in Output and Productivity in US and USSR Agriculture," US Congress, Joint Economic Committee, "Soviet Economy in a Time of Change, A Compendium of Papers," U.S. Government Printing Office, 1979, p. 48.

[17] For the 1976-81 period, in the USA 86 percent of agricultural output was consumed domestically and the net balance was exported (see U.S. Dept. of Agriculture, Agricultural Statistics, 1982, pp. 430, 525). However, it is believed that the US consumption level is more than adequate, and we reduce it to 80 percent as norm for illustrative purposes.

These per capita levels indicate that the USSR produced roughly 63 percent of the output of the United States in the 1966-75 period, roughly 59 percent in 1976-80, and only about 51 percent in 1981-82; this is clearly inadequate if we consider 80 percent of the US level to be the norm for an industrial society.

Eastern Europe as a whole shows a little more favorable per capital level and trend of output than the Soviet Union. In the 1971-80 period it produced roughly 66 percent as much agricultural output per capita as the United States. In 1981-82 the level dropped precipitously to 60 percent of the USA's because of poor harvests in most Eastern European countries due to adverse weather conditions, decreased feed imports and other factors. The per capita levels of output in Eastern Europe in comparison to the Soviet Union were improving in the 1971-82 period.

As for the individual countries, the highest per capita level in the whole period was achieved in Hungary, which had 87.7 percent of the US level in 1981-82, followed by Bulgaria with 73.6 percent, the GDR with 71.5 percent, Romania with 58.7 percent, Czechoslovakia with 56.3 percent, Yugoslavia with 51.8 percent, and, at the bottom, Poland with 49.6 percent. If we refer to the norm given above (80 percent of US output per capita=self-sufficiency), only Hungary would seem to have about 10 to 15 percent of her output available for export while providing more than adequate food for the domestic population. All other East European countries would be considered to have 8 to 38 percent deficits in domestic output if they were to maintain roughly the US food consumption level. Western Europe seems to be the most deficient region in per capita food supply, producing only about one-half as much as the USA. Per capita output levels show clearly that the domestic output of food in Eastern Europe and the Soviet Union was deficient by some 25 and 36 percent respectively in 1981-82, if the US norm were to be maintained; and this deficiency has been increasing in relation to the US per capita output levels since the mid-1970s.

## X. CONCLUSIONS

Some tentative conclusions on the recent performance of East European agriculture may be highlighted as follows:

(1) Agricultural performance as reflected in our measures has been uneven among the East European countries and over the period under study. Agricultural output in the 1971-75 period grew at an avearage rate of 3.9 percent for the whole region, or more than double the rate for the previous five years. In Hungary and Romania output expanded the most rapidly, followed by Poland, Yugoslavia, the GDR. Czechoslovakia, and Bulgaria. In the 1976-80 period, there was a slowdown in growth. Output grew at an average annual rate of 1.6 percent for the whole region, but in 1981 output decreased by 2 percent and in 1982 it rose by only 0.7 percent. In 1982, the best results were in Bulgaria, Hungary, Romania, and Yugoslavia, while in Czechoslovakia, the GDR, and Poland, there were declines in output of 1.3, 4.6, and 5.0 percent, respec-

tively. Poland's performance has been the worst since 1975. (See Table 2).

(2) In terms of gross and net product (i.e., agriculture's contribution to GNP and NNP), the best performance in 1975–80 was achieved in Hungary, Romania, and Yugoslavia and the worst in Bulgaria and Poland. In 1981–82 the best results were obtained in Bulgaria, Yugoslavia, Romania, and Hungary and the worst in Czechoslovakia, the GDR, and Poland.

(3) Progress in mechanization of agriculture has been good in Eastern Europe, but its level, except in Czechoslovakia and the GDR, is still behind that of Western Europe. Bulgaria, Yugoslavia, and Romania have the lowest levels of mechanization. However, the application of commercial fertilizers is in general closer to the West European level, and in Czechoslovakia, the GDR, and Hungary it is higher than in Western Eurpe as a whole. Bulgaria, Romania, and Yugoslavia saw the greatest expansion in the use of fertilizers in the last ten years.

(4) Considerably greater emphasis has been placed on animal output in recent years in order better to satisfy rapidly increasing demands for products of animal origin in all the East European countries. However, this effort has been slowed since 1980 by sharp decreases of animal feed imports.

(5) All the East European governments were putting increasingly stronger emphasis on increasing agricultural output and the productivity of land, capital, and labor. As a result of this policy, combined factor productivity increased in all countries except Poland from 1965 to 1974. Thereafter the factor productivity continued to rise only in Yugoslavia while stagnating in Bulgaria and Hungary and decreasing in Czechoslovakia, the GDR, and Poland, and making no progress for Eastern Europe as a whole due to adverse weather and other factors.

(6) An international comparison of agricultural outputs shows that Eastern Europe as a whole accounted for about 58 percent as much output as the USSR and about 34 percent as much as the USA in 1981–82. In turn, the USA's output was about 68 percent larger than that of the USSR in 1981–82. In terms of per capita levels of agricultural output, the USA ranks the highest, followed by Hungary, Bulgaria, the GDR, Romania, Czechoslovakia, Yugoslavia, the USSR, Western Europe, and Poland, in descending order for 1981–82. These findings are significant primarily in regard to self-sufficiency, and they do not take into account country specialization in the world division of labor, or more narrowly the various national priorities as to the allocation of manpower and other resources to agriculture and competing sectors of production.

(7) With the purported trend toward rational use of resources in Eastern Europe, leaders there, as elsewhere, may want to ponder the significance of systems of management as influences on production and productivity. Their concern with agricultural efficiency has prompted improvements in motivation through higher producer prices, higher profit, more freedom of action, control of resources, and other personal incentives. To emulate the successful Hungarian experience in agriculture, the governments in other East European countries have indicated in the last two years less discriminatory, more favorable agricultural policies toward private

farmers and owners of private plots. They have started to help private farmers directly with a series of material incentives in order to increase their output and productivity. It remains to be seen how far this new policy will be implemented and what favorable impact it will have on East European agriculture.

## APPENDIX A. NOTES AND SOURCES TO TABLES 1 TO 21

All quantity series and national prices needed for the construction of Tables 1 to 21 were taken from Publications by the Research project on National Income in East Central Europe, Columbia University, Riverside Research Institute (RRI), and LW International Financial Research (LWIFR), as follows:

Bulgaria: Gregor Lazarcik, "Bulgarian Aricultural Production, Output, Expenses, Gross and Net Product, and Productivity at 1968 Prices, 1939, and 1948–1970," OP-39, 1973 (updated to 1982). RRI and LWIFR, New York.

Czechoslovakia: Gregor Lazarcik, "Production and Productivity in Czechoslovak Agriculture, 1934–38 and 1946-1967." Ph.D. dissertation (updated to 1982). Columbia University, New York.

East Germany: Gregor Lazarcik, "East German Agricultural Production, Expenses, Gross and Net Product, and Productivity, 1934-38 and 1950-1970." OP-36, 1972 (updated to 1982). RRI, New York.

Hungary: Laszlo Czirjak, "Hungarian Agricultural Production and Value Added, 1934-38 and 1946-1965," OP-14, 1967 (updated to 1982). Columbia University, New York.

Poland: Andrzej Korbonski and Gregor Lazarcik, "Polish Agricultural Production, Output Expenses, Gross and Net Product, and Productivity, 1934-38, 1937 and 1946–1970," OP-37, 1972 (updated to 1982). RRI, New York.

Romania: Gregor Lazarcik and George Pall, "Romania: Agricultural Production, Output, Expenses, Gross and Net Product, and Productivity, 1938 and 1948-1971," OP-38, 1973 (updated to 1982). RRI and LWIFR, New York.

Yugoslavia: Joseph Bombelles, "Yugoslav Agricultural Production and Productivity, Prewar and 1948-1967," OP-31, 1970 (updated to 1982). RRI, New York.

Countries of Eastern Europe: Thad P. Alton, Elizabeth M. Bass, Laszlo Czirjak, and Gregor Lazarcik, "Statistics on East European Structure and Growth", OP-48, 1975. LWIFR, New York.

Thad P. Alton, Elizabeth M. Bass, Gregor Lazarcik, Wassyl Znayenko, and Joseph T. Bombelles, "Agricultural Output, Expenses, Gross Product, Depreciation, and Net Product in Eastern Europe, Prewar and 1965-1979," OP-62, 1980. LWIFR, New York.

Thad P. Alton, Elizabeth M. Bass, Gregor Lazarcik, Wassyl Znayenko, "The Structure of Gross National Product in Eastern Europe (Derivation of GNP Weights for 1975-1977)," OP-64, 1981. LWIFR, New York.

Thad P. Alton, Krzysztof Badach, Elizabeth M. Bass, Joseph T. Bombelles, and Gregor Lazarcik, "Agricultural Output, Expenses and Depreciation, Gross Product, and Net Product in Eastern Europe, 1965, 1970, and 1975-1982," OP-76, 1983. LWIFR, New York.

Joseph T. Bombelles, "The Structure of the Gross National Product of Yugoslavia, 1976," OP-79, 1983. LWIFR, New York.

USA and USSR: United Nations, Food and Agriculture Organization, "Production Yearbook, 1981," Rome, 1982. FAO, "Monthly Bulletin of Statistics," No. 7-8, 1983. Rome, 1983.

## APPENDIX B. METHODOLOGICAL NOTES

The definition of agriculture as an economic sector and the concepts and definitions of output and input measures used in this study have been set forth in detail in an earlier study of East European agriculture presented to the Joint Economic Committee of the U.S. Congress in 1970. (See Gregor Lazarcik, *Compendium 1970*, pp. 467-472.) Perhaps only a very brief summary of the methodology used here may be in order for the benefit of the reader.

Forestry, fishing and hunting are not included in agriculture, as may be the case in some UN statistics. The coverage of our data ranges from 95 percent to almost 100 percent of agricultural output, depending on the country. Our measures of output and inputs are based on physical quantity series consisting of from 70 to over 100 individual products for each country. Since the official output and input measures sometimes differ from those used by international organizations, or are not published, an independent, uniform calculation of all important measures was made by the Research Project on National Income in East Central Europe in New York in accordance with standard international definitions. These measures are presented in this study.

*Pricing system:* 1978 dollars were used for aggregation of agricultural output to facilitate international comparisons of East European countries. Also the wheat-based price relatives for Eastern Europe and the USSR for 1961-65 devised by the Food and Agriculture Organization of the United Nations for the calculation of regional agricultural production were used in Table 21.

Other measures (i.e., operating expenses, gross product, depreciation, and net product of agriculture) were derived from output (calculated in 1978 US dollars) on the basis of percentage relationships of these measures for each country and each year calculated in each country's constant prices paid to or by producers for their products or production inputs. (The national price weights used were as follows: Bulgaria, 1970 leva; Czechoslovakia, 1977 crowns; East Germany, 1975 marks; Hungary, 1976 forints; Poland, 1977 zlotys; Romania, 1970 lei; and Yugoslavia, 1972 dinars.) This system of valuation takes into account the differences in relative scarcities in each country, and at the same time it permits international comparisons in terms of constant 1978 US dollar prices for all countries.

The index numbers of various output and input measures are computed by a modified Laspeyres formula ($\Sigma P_k Q_i / \Sigma P_k Q_k$, where $P_k$ represents the selected constant prices, $Q_k$ the quantities of the base year, and $Q_i$ the quantities of the given year) using 1978 US dollars as weights. The time comparison base period chosen in this study is the year 1975.

*Agricultural output:* In this study agricultural output is defined as end-use output from agriculture available for human consumption and industrial use, plus changes in livestock, and farm investment in kind by farmers' own efforts. The same concepts are used by the U.N. economic organs to calculate agricultural output in Western Europe. In this study the output of agriculture is calculated by substracting from gross crop and animal production all intermediate products utilized on farms in further production. The physical quantities of output are then aggregated by 1978 US dollar prices, see US Department of Agriculture, Agricultural Statistics, 1979, Washington, DC, 1979, pp. 435–437 and 447–450.

*Expenses and depreciation:* Current operating expenses are defined here as the total quantity of all goods and services bought by the agricultural sector from all non-agricultural sectors and from abroad and used up in the production of agricultural output. Depreciation is here defined and calculated as the current charge to take account of wear, tear, and obsolescence of capital goods serving agriculture. (See UN Economic Commission for Europe, "Agricultural Sector Accounts and Tables, A Handbook of Definitions and Methods," Geneva, 1956, p. 10, and Organization for European Economic Cooperation, "The Measurement of Agricultural Production and Food Consumption," Paris, 1955, p. 15.)

*Gross and net product:* The gross product of agriculture is the gross value added by productive activity within the agricultural sector. It is the contribution of the agricultural sector to gross national product (GNP). In this study it is obtained from agricultural output by substracting current operating expenses. The net product of agriculture is the gross product minus depreciation. It is the contribution of the agricultural sector to the net national product (NMP) or net value added by the agricultural sector. For the years after 1970, the expenses, gross and net product were calculated by a shortcut method, described in detail in OP-48, pp. 74-93 and OP-62, notes to Tables 1.1 to 7.1.

## APPENDIX C. COMPARISON OF OFFICIAL AGRICULTURAL GROSS PRODUCTION AND CALCULATED AGRICULTURAL OUTPUT INDEXES IN EASTERN EUROPE

[1965 = 100]

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 [1] |
|---|---|---|---|---|---|---|
| Bulgaria: | | | | | | |
| Official gross agricultural production indexes | 100 | 118 | 137 | 143 | 152 | 159 |
| Calculated agricultural output indexes | 100 | 113 | 125 | 133 | 139 | 146 |
| Czechoslovakia: | | | | | | |
| Official gross agricultural production indexes | 100 | 127 | 144 | 157 | 154 | 155 |
| Calculated agricultural output indexes | 100 | 123 | 142 | 158 | 156 | 154 |

[1965 = 100]—Continued

| | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 [1] |
|---|---|---|---|---|---|---|
| German Democratic Republic: | | | | | | |
| Official gross agricultural production indexes | 100 | 109 | 125 | 134 | 136 | 136 |
| Calculated agricultural output indexes | 100 | 110 | 132 | 142 | 144 | 137 |
| Hungary: | | | | | | |
| Official gross agricultural production indexes | 100 | 115 | 144 | 163 | 166 | 178 |
| Calculated agricultural output indexes | 100 | 114 | 147 | 167 | 164 | 172 |
| Poland: | | | | | | |
| Official gross agricultural production indexes | 100 | 109 | 131 | 121 | 127 | 121 |
| Calculated agricultural output indexes | 100 | 108 | 128 | 126 | 117 | 111 |
| Romania: | | | | | | |
| Official gross agricultural production indexes | 100 | 110 | 150 | 181 | 179 | 193 |
| Calculated agricultural output indexes | 100 | 112 | 153 | 182 | 176 | 189 |
| Yugoslavia: | | | | | | |
| Official gross agricultural production indexes | 100 | 116 | 133 | 148 | 150 | 160 |
| Calculated agricultural output indexes | 100 | 116 | 136 | 157 | 159 | 170 |

[1] Preliminary.

Sources: Official indexes are taken from statistical yearbooks of the respective countries. Calculated indexes are from OP-76, tables 1-7, col. 1 in national currencies.

# EAST EUROPEAN AGRICULTURAL TRENDS AND PROSPECTS: A EUROPEAN PERSPECTIVE

By Karl E. Waedekin[*]

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## I. The Changing Role of Agriculture

The Communist policy of economic development at Stalin's time was very rigid. Through price-setting and limitations on inputs of supplies, capital was transferred from agriculture into heavy industry as the basis for rapid industrialization. Although the actual effectiveness of this policy may be doubted, the intention is clearly discernible. Change after Stalin's death was manifest not only in increased producer prices and labor remuneration but also in the rapidly increasing shares of agricultural investment throughout Eastern Europe. Growth in agricultural investment slowed again, during the second half of the 1950s, with the notable exceptions of Bulgaria and Czechoslovakia, but was resumed around the mid-1960s and was more or less generally sustained during the following decade. By that time, capital was no longer transferred out of agriculture, and was even transferred in.

The main reason for this change of policy was the recognition by Soviet and other Communist leaders that consumer demand for food could no longer be neglected; ample official statements support this view.

An additional concern was the efficiency of collectivized agriculture, which was completed by 1960–61 throughout Eastern Europe except for Poland, Yugoslavia, and Albania. Collectivization meant that any capital diversion from agriculture would have adversely affected the large-scale socialist farms that urgently needed a new kind of fixed assets, not the private peasant. Increased food supplies and qualitative changes in their composition (i.e., increasing the share of animal products, vegetables and fruit) have over time become the priorities of the leaderships. Their explicit food programs require some imports, which are paid for in hard currency, but currently rely most heavily on enhanced performance of the domestic food sectors.

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[*] University of Giessen.

Since the completion of collectivization and destalinization, a quite impressive long-term improvement in agriculture has been the increase of end use output—the measure of how people have been fed. This growth rate averaged from 1.0 to 3.2 per cent per annum during 1970–80, even if declining towards the end of that period into the early 1980s. (see G. Lazarcik in this volume, Table 2). To some degree, the excess of food demand over end-use agricultural rates, especially for quality foods, is a part of a country's normal economic development; that is, when industrialization and urbanization proceed rapidly and agriculture cannot keep pace, especially in quality sectors such as the livestock sector which requires a much faster growth of feed production. This appears to be the case in Poland, Romania and Yugoslavia where population growth continues to be rapid. Historically, the resulting gap has been made up by imports until domestic feed production is able to catch up to the growth of the herds. In countries with a low population/land ratio (i.e., many people per land unit), feed imports may continue indefinitely, but in those with a relatively high population/land ratio, both feed and meat may be produced in sufficient quantities as industrial growth provides agriculture with the necessary inputs to intensify land use and output.

Except for East Germany, all the countries of Eastern Europe by their natural endowments should belong to that second category; but only Hungary is fully self-sufficient to date. This shortfall in agricultural performance coincides with the failure of consumption as a whole to keep pace with industrial growth—a major failure of Soviet-type socialized production.

A major deficiency in agriculture throughout most of Eastern Europe is the lack of response of agricultural labor productivity to the increase of its industrially produced capital inputs. With the rural labor force on the decline and limits on expanding arable land, there are only two ways to overcome food shortages: through reforms of the economic system or still greater capital investment. Economic reforms in agriculture are limited to Hungary. More agricultural investment would pose difficult choices among priority claimants.

Comparing the growth rates of capital and off-farm expenses in East European agriculture (see p. 439), one finds that increased gross investment is needed even for sustaining past output growth. For more rapid growth, the capital requirements are greater than past and present availability. It probably is not by accident that very little and very sketchy data on planned agricultural investment under the current five-year plans have so far been published.

The limited industrial capacity to increase capital inputs for agriculture is compounded by the modest absorptive capacity of agriculture. Up to the present, the growth generated by rapidly increasing capital inputs has not been sufficient to compensate for the decline in land and labor. Low capital efficiency results from poor allocation, the low technological level of new investments, limited technical skills of the labor force (the GDR, Western Czechoslovakia, Hungary excepted), and the lack of adequate worker incentives. The cost of overcoming agricultural shortcomings may be viewed as requiring too high a price from industrial technical progress. At the same time, it is important to underline the fact that agriculture is not only the weakest link in a socialized economy, but also is the sector in which, due to the cumulative negligence of the past, the overall weakness of such economies appear to be greatest. One symptom of this more general deficiency is the inability to generate the export earnings necessary to pay for the large feed imports. In the industrialized economies of the West, capital inputs per rural worker exceed those for the work force as a whole, and represent increased investment over past ratios. The East European economies have not arrived at that stage. As long as this is the case, their natural potential for self-sufficiency in food, or even generating exports, will remain underutilized. Paradoxically, in spite of deficient technological progress, the investment requirements of their food sectors will seem disproportionate and a heavy burden on the economy on the whole. This disproportion is largely a result of the absence of agricultural reform.

## II. Regional Differentials in a Common Framework

The countries of East Central and Southeast Europe under Communist rule—which excludes Greece and the European part of Turkey [1]—form a geographical region, which has a number of climatic, economic, cultural, historical, and political characteristics in common, all relevant for agriculture. At the same time, the region is diversified in itself: Its moderate climate becomes more continental from West towards East. The Southeast contains higher mountain ranges, with the fertile great Danube basin in between, whereas slightly rolling plains and river lowlands are located in the Northwest and North. The historical Northwest-Southeast change in economic development levels, from the highly industrialized German Democratic Republic (GDR) and the Bohemian and Moravian parts of Czechoslovakia (CSSR) to agrarian Romania, parallels the changes in natural environment and also predetermines the kind of agricultural production: intensive livestock farming and feed crop production in the Northwest; less developed animal raising and less intensive crop production, except for fruit and vegetable areas in warm valleys, often under irrigation, in the Southeast. The Hungarians today prefer to consider their country as part of East Central rather than of Southeast Europe culturally as well as historically, and its recent agricultural development surely justifies such an identification.

Of course, additional regional and national differences within the overall area could be enumerated: population growth and urbanization differentials (causing different kinds and growth rates of food demand), and the degree of rigidity of domestic policies (combined with more or less "command farming"). Some other distinguishing factors are more directly related to the agricultural sector, such as the foreign trade position of a given country or the variations among them of agrarian structure. Yet all of them serve to explain differences, against a common background of socialist economic development in a climatic region that differs less in itself than from the neighboring USSR, West Central and Mediterranean Europe.

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[1] Due to lack of data and other information, Albania also is excluded from the discussion.

Policy differences are manifest not only in the continuing existence of a predominant sector of individual peasant farms in Poland and Yugoslavia as opposed to the other countries, but also in the different shares of state farms and private subsidiary production. State and comparable institutional farms in 1982 occupied 31 per cent of the agricultural land in Czechoslovakia and Romania as against only 8 per cent in East Germany; Bulgaria since 1972 knows a single property form of socialized farms, which accounts for 90 percent of the land use and is neither collective, nor strictly state-owned, but for all practical purposes represents state agricultural enterprises. Beside peasant farms, Yugoslavia, too, has only the self-administrating social farm enterprise, but there they represent no more than roughly one-fifth of overall agriculture.

In those countries in which agriculture has been socialized, the private agricultural sector consists of very few and small remaining individual peasant farms, mostly in the hilly areas of Romania, and of subsidiary plot and animal production by collective farmers, state farm workers and other rural inhabitants, as well as by a number of town or suburban dwellers. Such private production is intertwined with the socialist sector in several ways; for example, receiving part of the seed, feed and young animals from it and selling some of its produce to the large public farms. Interrelations in mixed agricultural sectors are especially difficult to measure, e.g., private meat output in Hungary.

There are also differences by country and region in grain yields. Southeast Europe, with the exception of Romania, in recent years has performed better in output growth than the North, e.g., industrialized East Germany, Czechoslovakia, and Poland. Of course, the climate of East Central Europe is less favorable for corn, which is produced in higher yields per acre than the small grains and, in addition, much of which is grown under irrigation in Bulgaria and Romania. Having expanded its irrigated land almost tenfold during 1951–1982, Bulgaria has 29 per cent of its arable and permanent crop land irrigated, which is one of the highest shares in Europe.[2] On the other hand, Romania, which recently experienced a similar expansion of irrigated area of up to 22 per cent of its arable and permanent crop land (1981), does not excel in crop yields. Yet Hungary where only 4 per cent of the arable area is irrigated has outperformed the other grain growers in yields recently. For such differences, there is hardly an explanation other than farming efficiency. Hungary also outperformed the other countries in the entirely different field of milk yields per cow (cf. below, Table 7).[3]

Although it is true that Yugoslavia's output per unit of agricultural land is the lowest in Eastern Europe, a few things have to be taken into account: First, Yugoslavia has the highest share of nonarable land in its agricultural area (45 per cent), much of which is located in low fertility hilly regions. Secondly, Yugoslavian expenses per land unit are the lowest in Eastern Europe. Yugoslav net product per land unit is above the East European average and close to the Hungarian level. In spite of the lower than average land/labor ratio (i.e., less land per worker), the factually lower labor cost (peasant income) keeps the cost of net output per hectare also around the East European average. (For the above considerations, see the figures of Lazarcik, Tables 12 and 20.)

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[2] Data from *FAO Production Yearbook 1982*, Rome 1983.

[3] The milk increase is in part due to high-breed cows imported from the West, but obviously these were properly tended and fed in Hungary.

## III. THE NEED FOR OUTPUT INCREASES

The case of Romania clearly demonstrates that the growth of demand has been the decisive factor. Food production there has grown rapidly, even if allowance is made for statistical over-reporting, but more rapid still has been the growth of demand resulting from population increases, rising nonagricultural wage incomes and social change. In other words: Instead of the former great mass of peasants, who, if not underfed, were used to eating their mamaliga with meat on Sundays and festivals only, there now is a majority of wage-earners, who—though by no means wealthy—buy more and better food, whether in the official or in the black and gray markets.

Food demand in excess of domestic production is a common feature of the East European economies, with the exception of Hungary and perhaps Bulgaria. This excess demand is no longer indicative of absolute malnutrition but instead is a product of unsatisfactory quality and mix of the available diet, and is determined to a large extent by industrialization, urbanisation, and rising nonagricultural labor incomes and the concomitant changes in eating habits. If one multiplies the number of non-agricultural workers and employees with the average labor income, corrected by the official wage inflation factor, and assumes income elasticity of food demand at a coefficient of 0.6, the following emerges:[4]

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[4] It is not possible to exclude the agricultural wages from the overall average wages in the statistics, but the distortion is minor because the share of such wage-earners is small, as collective farm members are excluded by the given statistical definition. The number of agricultural wage-earners (other than collective farm members) had to be excluded, because it changed over time in ways which differed by countries together with farm structure changes. Thus, their number grew threefold in Bulgaria, by one third in Romania and insignificantly in the other countries. The income figures are derived from the data in *Statisticheskiy ezhegodnik stranchlenov SEV*, 1983 (Moscow 1983), pp. 46 (index of real wages), 385–389, 393–396; wages for the GDR from *Statistisches Jahrbuch der Deutschen Demokratischen Republik*, 1982, p. 119.

The demand elasticity coefficient is a rough estimate but has proven plausible on other occasions; very likely it is higher than 0.6 for meat and some other high-quality food, and lower for other foods.

A serious flaw of these calculations is due to the fact that the used official real wages indices almost certainly understate actual inflation of consumer good prices. According to the consumer price index in the *CIA Handbook of Economic Statistics 1983*, p. 51, the understatement was greatest—more than 10 per cent—in Romania during the first half of the 1970s and, surprisingly, in Bulgaria throughout the decade. Particularly Bulgarian food prices were raised—apart from free markets—mainly towards the end of the period in question, whereas other consumer goods prices were raised at various earlier times, too. As to Romania, one has to have additional qualms about the reliability of the output figures.

With such caveats, the discrepancy of the growth rates is so telling that the alarming development of demand and supply in Romania and Poland is demonstrated clearly enough.

TABLE 1.—GROWTH INDICES OF NONAGRICULTURAL WAGE SUMS AND DERIVED FOOD DEMAND IN 1982 COMPARED TO AGRICULTURAL END-USE OUTPUT (1980–82 AVERAGE) OVER 1970 (=100)

|  | Sum of wages | Food demand (at 0.6 income elasticity) | Agricultural output (Lazarcik) |  |
|---|---|---|---|---|
|  |  |  |  | Animal products of which: |
| Hungary [1] | 134 | 120 | 145 | 141 |
| Bulgaria [2] | 160 | 136 | 123 | 149 |
| Poland | 139 | 123 | 106 | 113 |
| Romania | 232 | 179 | 154 | 153 |

[1] During the final 3 years 1980–82, real wages in Hungary did not rise, and the number of workers and employees decreased.

[2] During the final 3 years 1980–82, real wages in Bulgaria continued their rise, by an overall 7.6 per cent, and, the number of workers and employees increased. Cf. the note on estimated overstatement of Bulgarian real wages in footnote 4, which would account for most of the demand/output gap.

Source: Statisticheskiy ezhegodnik stran-chlenov SEV 1983.

Of course, the food demand/supply situation was strained already in 1970, the initial year covered by the Table. Even so, the picture of relative increases of income and agricultural output since 1970 fits quite well into what is otherwise known about the food supply situation in these four countries, for which official wage deflators were published.

For East Germany, where no data on real versus nominal wage development are published, the ratio of the increase of demand (wage increase at a coefficient of 0.6) to end-use agricultural output, was 143:128 up to 1981. Such a disproportion contradicts what many observers have reported about more or less adequate food supply in the GDR in recent times. Yet, if one does not accept the proposition that there has been no inflation and/or assumes that because of the already high consumption level the elasticity coefficient was below 0.6, then one finds the two indices balanced. Still, East German shortages of animal products were reported in fall, 1982.

In Bulgaria, the formerly weak livestock sector made good progress in output per animal (less so in per unit of capital input, cf. below) in its socialized sector and—since 1974—even more in the private sector. This improvement was based in part on imported feedstuffs, while domestic crop production stagnated during the 1970s.[5] It also should be noted that vegetable oil, vegetables (exclusing potatoes) and fruit consumption in Bulgaria had been higher than in the other CMEA countries before as well as after 1970. So the elasticity of demand for carbohydrate food was not likely to be high, as long as demand for animal products was satisfied.[6]

Even in Bulgaria, a rapid increase in agricultural production has remained imperative because of the growth of demand and need for feed imports, which have to be paid almost entirely in hard currency. The corresponding situation is yet more acute for Czechoslovakia and East Germany, not to mention Romania and Poland, where considerations of domestic demand as well as of foreign trade balance urgently require output increases.

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[5] It is striking that Lazarcik's calculated index of end-use output deviates most from the official index (which includes some double-counting of intermediate products) in the case of Bulgaria and that this difference is almost entirely due to crop production; see Lazarcik, Tab. 2 and Appendix C, as well as Statisticheskiy ezhegodnik . . ., p. 177.

[6] Although the data contained in Statisticheskiy . . ., pp. 48–49—per head consumption of meat, milk and eggs—show consumption in Bulgaria very low in the beginning, they rose faster there than in any other CMEA countries during the 1960s and the 1970s, and even during 1981–82.

## IV. FOREIGN TRADE AND DOMESTIC MEAT CONSUMPTION

The impact of agricultural foreign trade is enhanced by the imbalances in the general foreign trade of the East European countries and their indebtedness toward the West. Hungary is the one exception where not only the domestic demand for food is satisfied (at given prices and incomes), but agriculture and the food industry contribute significantly to improving the strained foreign trade balance as well.

According to the data supplied to the FAO by the East European countries, they had the following three-year average 1978–80 balances in their agricultural foreign trade at a time when the effects of the Polish crisis and the negative overall foreign trade and payments balances had not yet made themselves felt to any significant degree:

| [In U.S. dollars] | *Millions* |
|---|---|
| Poland | −1,505 |
| German Democratic Republic | −1,767 |
| Czechoslovakia | −1,431 |
| Yugoslavia | −542 |
| Bulgaria | +682 |
| Hungary | +799 |
| Romania | +157 |

Source: FAO Trade Yearbook 1982, Rome 1983, Tab. 6.

Strikingly, all East European countries had become net exporters of meat by the end of the 1970s. This applies even to Czechoslovakia and East Germany, although of the Czechoslovak meat exports, 25 percent is due to grain and protein feed grain imports. It has likewise been calculated in the case of the GDR that 20 percent of its total animal production is based on imported feed.[7] The total of East European meat exports has come close to the current volume of Soviet net meat imports, which ranges from one-half to one million metric tons per year. However, for reasons of their convertible currency balance, they export as much as they can to Western countries or, so far, against such currency—or "hard commodities"—among each other. Therefore, it is unlikely that the Soviet Union will satisfy its total meat import demands on the CMEA market.

TABLE 2.—THREE-YEAR AVERAGES OF FOREIGN TRADE BALANCES IN MEAT, 1969–1982

[In thousands of metric tons] [1]

| | Poland | German Democratic Republic | CSSR | 3 northern countries together | Yugoslavia | Bulgaria | Hungary | Romania | 4 southern countries together |
|---|---|---|---|---|---|---|---|---|---|
| 1969–71 | +91 | +2 | −85 | +8 | +97 | +38 | +95 | +42 | +273 |
| 1972–74 | +150 | ±0 | −42 | +108 | +60 | +92 | +144 | +78 | +313 |

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[7] "Rolnicke Noviny," November 12, 1982, p. 3, and Prof. Konrad Merkel's calculations, as yet unpublished.

TABLE 2.—THREE-YEAR AVERAGES OF FOREIGN TRADE BALANCES IN MEAT, 1969–1982—Continued

[In thousands of metric tons] [1]

| | Poland | German Democratic Republic | CSSR | 3 northern countries together | Yugoslavia | Bulgaria | Hungary | Romania | 4 southern countries together |
|---|---|---|---|---|---|---|---|---|---|
| 1975–77 | +219 | +29 | −13 | +128 | +69 | +96 | +231 | +155 | +552 |
| 1978–80 | +130 | +40 | +8 | +178 | +42 | +100 | +295 | +131 | +568 |
| 1980–82 [2] | +18 | +24 | +22 | +64 | +51 | +84 | +354 | +123 | +612 |
| Per head as of mid 1981 | +8.5 | +1.7 | +1.4 | ... | +1.3 | +9.4 | +33 | +5.5 | ... |

[1] Meat, fresh, chilled and frozen (SITC 011), meat, dried, salted, or smoked (SITC 012), canned meat and meat preparations (SITC EX 014). A minus sign means a passive, a plus sign an active trade balance.

[2] 1982 data are preliminary.

Source: FAO Trade Yearbook, various volumes.

The two country groups included in the above table are about equal in terms of population and arable land: Poland, East Germany and Czechoslovakia together in 1982 had 68 million inhabitants and 24.4 million hectares of arable land: Yugoslavia, Bulgaria, Hungary and Romania—65 and 26 million, respectively. Quite clearly the major exporters are those of the Southern group, even more so when one takes into account their smaller feed grain imports (Table 4). In each group it is one country that largely determines the overall meat balance—Poland in East Central Europe, Hungary in Southeast Europe. Hungary's leading position began to emerge only after 1970, and since then has become more and more conspicuous, together with a steep rise (up to 1981, at least) of its population's meat consumption. Bulgaria's progress in meat exports has been modest, but when combined with its rapid increase in domestic consumption per head, it is no less remarkable. By contrast, Romania and Yugoslavia were not successful in their known efforts to step up meat exports; this can only be traced in part to the development of their domestic meat consumption. Even before the social and political disturbances and economic depression of 1980–81, Poland's meat exports had been declining and domestic consumption stagnating.

TABLE 3.—MEAT CONSUMPTION PER HEAD, 1960–82

[Amounts in kilograms [1]]

| | Poland [2] | GDR | CSSR | Yugoslavia | Bulgaria [2] | Hungary | Romania |
|---|---|---|---|---|---|---|---|
| 1960 | 49.9 | 55.0 | 56.8 | 27.8 (1961) | 32.7 | 47.6 | 26.6 (1965) |
| 1970 | 61.2 | 66.1 | 71.9 | 37.6 (1971) | 43.7 | 58.1 | 45.7 (1975) |
| 1980 | 82.1 | 89.5 | 85.6 | 54.7 (1981) | 64.9 | 71.7 | 54.4 (1979) |
| 1982 | 58.6 | 91.0 | 81.0 | ... | 73.1 | [3] 76 | ... |
| Increase of urban population in percent, 1960–82 | 50 | 3 | 43 | ... | 91 | 32 | 97 |

[1] The definition of "meat," more or less uniform in the CMEA statistics, comprises a number of inferior byproducts, which in most Western statistics would not be counted as meat.

[2] Including bacon fat and lard.

[3] Including fish and fish products in 1982.

Sources: Statisticheskiy ezhegodnik stran-chlenov SEV, 1983, p. 48–49 Statisticki Kalendar Jugoslavije 1983, Belgrade 1983, p. 62 Scinteia, June 13, 1978, Aug. 12, 1979.

The absolute population increases were, of course, not as great as those of the urban population, and slowed during the 1970s. But they did influence the quantities available per head. Overall population growth during 1960–82 was fastest in Poland and Romania (23 and 22 per cent, respectively), and in absolute terms consumption of meat more than doubled in Romania and (up to 1980) doubled in Poland. The spectacular increase of meat consumption per head in Bulgaria was facilitated by slower growth of the total population (by 13 per cent, as in Czechoslovakia) in spite of a steep increase of its urban segment. Hungary's total population growth was slow (7 per cent over the 22 years); that of East Germany even negative (minus 3 per cent).

Obviously, the East European countries, following the Soviet example, were very reluctant from the beginning to resort to imports of animal products and instead enlarged their herds, apparently in the hope of quickly raising their productivity, too. As such hopes did not come true (except in Hungary), feed consumption per head of livestock remained low, but more feed per unit of output was needed. In short, no progress in conversion ratios was made. Expanding herds was an expensive way of increasing livestock production, and indeed one which offered few incentives for raising productivity per animal and per feed unit. As a consequence, feed imports could not be avoided in the end, mainly of grain and oilseeds.

The foreign trade balances for grain show great fluctuations from year to year, largely depending on each year's domestic grain harvest and the overall foreign trade situation. For these reasons, annual data are reproduced in Table 4, with three-year averages in the beginning and the end to characterize the mid-term development over the decade.

TABLE 4.—GRAIN [1] IMPORT-EXPORT BALANCES, 1969–81

[Amounts in 1,000 metric tons]

| | Poland | GDR | CSSR | 3 northern countries together | Yugoslavia | Bulgaria | Hungary | Romania | 4 southern countries together |
|---|---|---|---|---|---|---|---|---|---|
| 1969–71 | −2,378 | −2,705 | −1,771 | −6,855 | +224 | +229 | +37 | +633 | +1,123 |
| 1969 | −1,835 | −1,940 | −1,764 | −5,543 | +178 | +18 | +137 | +1,368 | +1,701 |
| 1970 | −2,376 | −3,335 | −1,372 | −7,084 | +131 | +307 | +639 | +315 | +1,392 |
| 1971 | −2,925 | −2,816 | −2,176 | −7,916 | −982 | +364 | −667 | +217 | −1,068 |
| 1972 | −2,994 | −3,789 | −1,638 | −8,411 | −948 | +839 | −244 | +444 | +91 |
| 1973 | −2,935 | −3,029 | −1,691 | −7,655 | +103 | +153 | +1,494 | −127 | +1,637 |
| 1974 | −3,919 | −2,821 | −1,071 | −7,812 | −624 | −485 | +1,472 | −663 | −300 |
| 1975 | −3,967 | −3,422 | −1,000 | −8,389 | +50 | −462 | +1,136 | −64 | +660 |
| 1976 | −6,099 | −5,016 | −2,105 | −13,220 | −386 | +23 | +1,476 | −15 | +1,098 |
| 1977 | −5,802 | −2,651 | −1,291 | −9,743 | −232 | −262 | +735 | −249 | +516 |
| 1978 | −7,355 | −3,145 | −1,003 | −11,503 | +109 | +438 | +451 | +648 | +770 |
| 1979 | −7,277 | −3,378 | −2,185 | −12,839 | −1,716 | −499 | +328 | −1,452 | −3,339 |
| 1980 | −7,724 | −4,025 | −2,032 | −13,782 | −1,108 | −28 | +784 | −525 | −877 |
| 1981 | −7,216 | −2,986 | −987 | −11,189 | −147 | −626 | +1,288 | −1,166 | −651 |
| 1982 [2] | −4,566 | −2,967 | −239 | −772 | −1,053 | +629 | +1,621 | −561 | +636 |
| 1980–82 [2] | −6,502 | −3,326 | −1,086 | −10,914 | −769 | −8 | +1,231 | −751 | −297 |
| Kilograms per head of the population (mid-1980), average 1980–82 | −181 | −199 | −71 | | −34 | −1 | +115 | −34 | |

[1] Cereals in the FAO definition (SITC 041–045.2, 0.45.9, 0.46).

[2] 1982 data are preliminary.

Source: FAO Trade Yearbook, various volumes.

Again, the "Northern tier" stands out as the main importer. For the Southeastern countries, the situation is quite different from that of the meat trade. Three of them now have to import grain in order to meet the needs of their domestic feed balance, independent of whether their imported grain is for feed or for direct human consumption. From former exporters of grain, Yugoslavia and Bulgaria turned into importers in the early 1960s, and even Hungary did so at that time. By the end of that decade, Bulgaria and Yugoslavia again became net exporters but only for a number of years. Remarkably, Hungary has stayed a net exporter of grain since then, although not selling quite as large quantities as in the early 1970s, while, at the same time, becoming a substantial exporter of meat. Romania, which had exported meat throughout the postwar period and grain up to 1972, since then has turned into an importer of increasing quantities of grain. On a per capita basis, the quantities of grain imported by Romania from 1980–82 were equal to those of Yugoslavia, but much below those of the Northern three countries.

Another decisive factor for animal productivity is high protein feedstuffs, for which oilseeds are currently the most important single item. Even Hungary has to import them. The imports of these feedstuffs fluctuate less than domestic production and less than those of grain, forming a large—often the greatest—part of total annual protein feed consumption requirements. The data are reproduced in three-year averages in Table 5. In Southeast Europe, where soybeans can be raised, their domestic output in the four countries together has greatly expanded, from 115 million tons in 1969–71 (3-year average) to 757 in 1982.[8] Romania, the main producer (431 million tons in 1982 as against 102 million in 1969–71) clearly wants to increase further its output: even after the 1982 production figure did not amount to three-fifths of the target, the plan figure for 1983 was still set at 669 million tons. Recent Hungarian plans for soybean production seem less firm because of low profitability under given conditions.

TABLE 5.—IMPORT-EXPORT BALANCES OF OILSEED CAKE AND MEAL AND OF OTHER VEGETABLE OIL RESIDUES, THREE-YEAR AVERAGES 1969–81

[In thousands of metric tons]

| | Poland | GDR | CSSR | 3 northern countries together | Yugoslavia | Bulgaria | Hungary | Romania | 4 southern countries together |
|---|---|---|---|---|---|---|---|---|---|
| 1969–71 | –310 | –539 | –309 | –1,158 | –172 | –101 | –321 | –41 | –635 |
| 1972–74 | –665 | –811 | –557 | –2,033 | –201 | –216 | –443 | –187 | –1,054 |
| 1975–77 | –1,000 | –916 | –602 | –2,518 | –205 | –255 | –547 | –276 | –1,283 |
| 1978–80 | –1,237 | –950 | –667 | –2,854 | –138 | –170 | –634 | –325 | –1,267 |
| 1980–82[1] | –1,168 | –1,079 | –720 | –2,967 | –176 | –191 | –582 | –361 | –1,310 |
| Kilograms per head of the population (mid-1980), average 1979–81 | –33 | –64 | –47 | | –8 | –21 | –54 | –16 | |

[1] 1982 data are preliminary.

Source: FAO Trade Yearbook, various volumes.

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[8] Output data according to FAO Production Yearbook, 1982.

Consumption of high protein feed may be considered a sympton of improving animal production, and vice versa. In that regard, East German and Hungarian imports are large on a per capita basis, whereas Yugoslav, Bulgarian and Romanian imports are small. It should be added, though, that in the latter three countries, cattle and sheep, which require less concentrate feed, play a relatively greater role, while Hungary, East Germany and Poland are primarily pork producers.

## V. Availability of Land, Labor, and Capital

Agricultural output growth is conditioned by the overall supply of three factors: land, labor, and capital. In spite of efforts to the contrary,[9] tilled arable land acreage has been going down. There is little reason to assume that this secular trend, well-known for most industralized countries, can be reversed; at best, it may be slowed. Romania is an exception with its great—capital-intensive—expansion of irrigated area, which, however, far exceeds the net gain of arable land.

As to labor, its shortage is a recurrent theme in East European publications and speeches. Yet comparing Eastern with Western worker/land ratios and taking into account its extremely large farm sizes, socialized agriculture might be considered overmanned. However, labor shortage or surplus is a function of available capital and its quality and efficiency on the one hand, and of incentives under given working conditions, as distinct from formal wage payment schedules, on the other; both factors often are interdependent and leave much to be desired in East European livestock raising. As to crop farming, it is the peak times of work when labor shortages do press on productive performance. The secular trend of labor migration from the countryside to the cities and the decrease in labor through ageing have been characteristic, and in some regions have resulted in serious demographic and economic consequences, e.g.,[10] in Romania or on the hill farms in the Slovene Republic of Yugoslavia.

By international comparison, however, loss of agricultural manpower has been rapid only in Bulgaria, Romania and, up to the early 1970s, in East Germany. Most recently, it has slowed in all European CMEA countries, and has kept pace in Yugoslavia. In spite of the decline becoming zero in East Germany, Czechoslovakia and Hungary, and even undergoing a reverse during 1981, a lasting turnaround of this trend is very unlikely. Such a reversal would go against long-term developments in Eastern Europe as well as in all those parts of the world where the birth rate has fallen below two per cent, and natural population growth to less than one per cent, as has occurred in all the countries discussed.

All the same, the past decline of labor numbers in East European agriculture was slower than could have been expected in view of the rapid increase in capital outlays. As a consequence, labor costs increased even in absolute terms, because the low remuneration per worker could not be continued for socio-political reasons.

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[9] The exception of Bulgaria since 1970 does not relate to the overall arable area, but only to its tilled part. For Romania, see below.

[10] For regional "depopulation" in rural Romania, see *Flacara*, no. 43, Oct 10, 1981, and *Revista Economica*, no. 51, Dec. 18, 1981 (as quoted in *Osteuropa*, no. 7, 1982, p. 591).

Under these circumstances, capital and its effectiveness has become the decisive factor in East European agrarian policies for attaining the required levels of output growth. The absolute as well as the comparative supply of capital for the various national food sectors cannot be shown in aggregate and/or comparable (monetary or other value) terms because of a lack of data and because of exchange ratio problems and differing price structures. No doubt, agriculture's share in total investment has been rather high, if compared to its share in producing the national income (see Lazarcik, Table 19). But then, this income (or GNP) is smaller than that of the highly industrialized countries, so that in absolute terms--or per hectare (acre) and worker—the investment volume is less impressive.

Some quantitative information can be obtained from the data on tractor horsepower and fertilizer supply (See Lazarcik, Tables 17 and 18). They reveal a certain saturation with tractor power in the Northern tier, even in Polish peasant agriculture (if one disregards quality and the present extreme shortage of spare parts and tires),[11] which had been severely under-supplied as late as the early 1970s. In the Southeast, the backlog is still marked. The gap between these two country groups has so far been closing rather slowly. An impression of saturation is also gained from the numbers of grain combine harvesters per grain sown area, where even in Poland and Romania—but not so in Yugoslavia—the ratio of 150-200 hectares (375-500 acres) per harvester is similar to that on North American grain farms. With respect to mineral fertilizer supplies,[12] the gap between the East European countries is unmistakably narrowing. The inputs are currently as high as in most of Western Europe, and considerably higher than the North American average.

Although consumption data are incomplete, the figure on consumption of electrical energy given in the CMEA statistical annuals (which includes nonproductive, e.g., communal, household, etc., consumption on farms or in villages) is a useful indicator. The data on electrical energy consumption suggest a second stage of agricultural modernization, after the first one of mechanizing the main field operations, as they relate to stationary machinery such as milking parlors, sewage removal installation, transport conveyor belts, irrigation of certain kinds, etc. Per farm worker, electrical energy consumption is highest in East Germany, followed by Czechoslovakia, and still very low in Yugoslavia and Romania. Yet all those countries have come close to the East Central European level, most obviously in the case of Hungary, and least of all in the case of Bulgaria. As a percentage of the national total, electric energy consumption in agriculture is still rather low. The shares ranged from 3.0 percent (Bulgaria) to 6.8 percent (Hungary) in 1982. Although highest in such percentage terms, the Hungarian figure, calculated per worker and per hectare (acre), still remained very much below the GDR level, where the absolute number of kilowatt hours (kwh) consumed in the agrarian sector was almost double.

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[11] About half of the tractors of Polish peasants are said to be ready for scrapping—*Rzeczpospolita*, Jan. 29-30, 1983 (according to *Radio Free Europe Research*, Polish Situation Report 2, Feb. 5, 1983, p. 3).

[12] In socialist agriculture, one has to deduct 10 to 15 percent for losses in transport, storage and spreading in order to arrive at figures for actual application.

In 1982 these shares were less than half of those held by agriculture in the "basic funds" (i.e., fixed capital stock, Communist definition) which accounted for a surprising 18.1 percent in Poland at that time. (No comparable data are available for Yugoslavia.) This high percentage for Poland was probably due to an over-evaluation of existing—mostly old—small peasant farm buildings and implements; the other CMEA countries, those where large socialist farms dominate, had between 8-9 (GDR) and 11-12 percent (Hungary). In recent years, the percentages have roughly corresponded to those of agriculture's contribution to the produced national income in Poland and the GDR; they were higher in the CSSR, and lower in Hungary, Bulgaria and Romania. The relationships were similar for investment, only in the GDR was it reversed, i.e., agriculture's share in total investments was higher than its contribution to national income.[13]

Although this discussion of the importance of efficiency in agriculture gives some perspective on the position of the food sector in the overall economy and economic policy of a country, conclusions from its percentage share in fixed capital stock and/or investment as compared to its contribution to national income can be misleading, as long as land—agriculture's most important asset—is not taken into account. Published Communist statistics do not assess the value of land. For Hungary, V. Marillai, from the Budapest Research Institute of Agricultural Economics, estimated it at 2.5 times the value of total agricultural "basic funds".[14] If that assessment more or less corresponds to economic reality, the fixed capital stock amounts to less than one-third of Hungarian agriculture's productive assets. However, a meaningful relationship between the agriculture and a country's economy at large still cannot be established, as the value of the land used by the other branches remains unknown. Moreover, labor remuneration in relation to comparative labor productivity in agriculture must also be taken into account, if one wants to make a judgement on capital transfers between agriculture and the rest of the economy.

Fixed capital stock ("basic funds") in East European agriculture has roughly doubled from 1970 to 1982. Its volume had been rather small during and immediately after the formation and consolidation of socialist farms in the late 1950s and early 1960s. Little modern capital stock had been left or was made available during the first postwar decade and a half, and most of the then existing farm buildings were not suited for large-scale production. From 1960 to 1982, total "basic funds" in agriculture, according to CMEA statistics, increased more than fourfold in Bulgaria, Hungary and Romania, over threefold in East Germany and Czechoslovakia (where the inherited initial stock had been greater). In Poland and

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[13] For the underlying data, see *Statisticheskiy* . . ., pp. 41–47, 137, 141.

[14] Vilmos Marillai, "Probleme und Aufgaben bei der Modernisierung der Ungarischen Landwirtschaft", *Agrar- und Ernahrungswirtschaft in West- und Osteuropa,* Munster-Hiltrup 1982, S. 131.

Yugoslavia growth was slow during 1960–70, but later accelerated and became roughly equal to that of the other countries, totaling somewhat less than threefold up to 1982.

TABLE 6.—GROWTH INDICES OF CAPITAL IN AGRICULTURE, 1975, 1980 AND 1982

[1970 = 100]

| | Poland | GDR | CSSR | Yugoslavia | Bulgaria | Hungary | Romania |
|---|---|---|---|---|---|---|---|
| Basic funds: | | | | | | | |
| 1975 | 128 | 127 | 133 | ........ | 137 | 150 | 143 |
| 1980 | 197 | 163 | 186 | ........ | 177 | 201 | 226 |
| 1982 | 210 | 182 | 211 | ........ | 182 | [1] 208 | 247 |
| Gross investment: | | | | | | | |
| 1975 | 190 | 115 | 170 | 165 | 140 | 105 | 142 |
| 1980 | 186 | 111 | 170 | 187 | 149 | 108 | 203 |
| 1982 | 137 | 104 | 192 | ........ | 136 | 113 | 219 |
| Expenses and depreciation: | | | | | | | |
| 1975 | 143 | 136 | 133 | 129 | 110 | 144 | 169 |
| 1980 | 153 | 151 | 147 | 168 | 138 | 185 | 211 |
| 1982 | 114 | 151 | 161 | 176 | 250 | 188 | 211 |

[1] 1981.

Sources: For basic funds and gross investment—Statisticheskiy ezhegodnik stran-chlenov SEV, 1983, pp. 45–46 (combining the indices and the percentages) and p. 144.

For expenses and depreciation—Lazarcik, table 3 (recalculated for a 1970 = 100 basis).

For investment in Yugoslavia (agriculture including fishery)—Statisticki godisnjak Jugoslavije, 1982, p. 86.

Because of the low initial level, much of the early gross investment was actually net of replacement. However, with capital stock growing, the share of re-investment could not but increase. Thus, annual gross investment now must increase in real terms (at constant prices) if the continuing buildup of capital stock is to be ensured. The recent decline of the volume of investment in East Germany, Bulgaria, Yugoslavia and, most of all, in Poland is alarming.

The "expenses and depreciation", as calculated by Lazarcik, comprise variable capital outlays, except for farm labor remuneration, and most of the gross investment of the CMEA statistics, though not all.[15] As current capital expenses also must increase along with fixed assets and other means of agricultural modernization (e.g., through outlays for fuel, lubricants, electric energy, mineral fertilizer, plant protection), the volume as well as the growth rate of "expenses and depreciation" should tend to exceed that of gross investment. On the whole, this has been the case in Bulgaria and Yugoslavia during most recent years, and over a longer period in East Germany and Hungary. Significantly, agriculture's performance in the latter two countries is better than elsewhere in the region, and Bulgaria has recently been catching up. The outstanding negative example, with substantial arrears, poor growth in capital output relationships and agricultural performance, is Poland.

As the prospects are dim for effecting growth by increasing inputs without changing the economic parameters, a qualitative improvement in utilizing the available, restricted means has become imperative. The results of stepping up capital supplies and quickly raising labor remuneration after the socialization of agriculture, or in Poland and Yugoslavia of at least somewhat relieving the input restrictions and price pressures on the individual peasant, have been disappointing. The governments in Eastern Europe have now been forced to adopt certain measures for overcoming inefficiencies of production through better organization and administration, and through better devised performance incentives for workers as well as managers on farms. (As these measures are dealt with in the individual country sections in volume III, only their common basic character is pointed out here.) One hesitates to call them "reforms," as they carefully avoid systemic changes, especially where the planning and directing of resources and output are concerned. Only Hungary went in that direction as early as the late 1960s, and since 1979 one discerns a limited weakening of the centralization element in Bulgaria, too.

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[15] E.g., not material and labor cost of on-farm investment for construction, enlarging livestock herds, etc. For the CMEA definition, see *Statisticheskiy* . . ., p. 439.

Still, some novel features emerge in East European agrarian policies: In the area of organization, less emphasis is now being placed on the so-called agro-industrial complexes and enterprises, i.e., on premature agri-business, socialist style. Central planning and its mandatory fulfillment has been made less exacting and rigid. All governments have accorded greater weight to price-oriented instead of command production and, except in East Germany, consumer food prices are no longer stable, so as to diminish the huge food price subsidies in the state budget. In the processing and marketing sphere, including storage, a comprehensive program on the management of the food economy is being set up which is expected—though not sure—to achieve greater flexibility and efficiency in meeting rising consumer aspirations. More attention is being paid—though still not enough—to investment devoted to rural infrastructure outside of the production sphere, i.e., supplies of consumer goods and communal services and the socio-cultural development of the countryside. And last but not least, a more relaxed official attitude has been adopted, even in East Germany and Czechoslovakia, towards the private sector as part of the efforts to accelerate production growth in agriculture without an overproportionate rise of input costs.

## VI. The Private Sector

To try and assess the share of the private sector in aggregate figures on the basis of land would be misleading. The private crop sector in the five countries with collectivized agriculture produces for the most part vegetables (other than potatoes), fruit, berries and wine on small intensively utilized plots. The crop output share in years past was much smaller than that in animal production, with the one exception of Romania, where both achieved rather similar high shares for the private sector in 1978.[16]

In private animal production, the supply of more high protein feedstuffs (see above) would be especially adequate where technically low skilled labor, including part-time labor of housewives, invalids, old people and juveniles is still amply available and where old or small livestock facilities can thereby be put to more productive use; in other words, under conditions when modern capital can be saved. Individual small peasant farms, such as those in Poland and Yugoslavia, are ideally suited in that sense, as are private subsidiary producers where and when they are permitted to play a considerable role in livestock raising alongside large-scale farms, which concentrate on less labor-intensive and more easily mechanized crop production. Such coexistence and division of labor are particularly important with regard to animal production, which has experienced the most severe supply bottlenecks.

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[16] Oprea Parpala, Economia si politica agrara in *Republica Socialista Romania*, Bucharest 1980, p. 323: 41.5 percent in crop, and 45.9 percent in animal production.

Although Poland and Yugoslavia seem to be predisposed to take advantage of such circumstances, both governments shied away from giving private farmers much leeway in expanding their operation and establishing free markets. Poland's state farm sector was the main benefactor of the large feed imports, as well as the imports of other agricultural inputs, which were used very inefficiently; meanwhile, Yugoslavia did not import sizable quantities of oilseeds at all. (See Table 5 above.)

Czechoslovakia and the GDR are known for their very small private agricultural sectors. Aggregate output data for these sectors are not published, and livestock numbers clearly reveal a share of less than ten per cent for meat and still less for milk output.[17] The Czech data show the shares as well as the absolute quantities declining from milk and eggs, but again an increasing share of meat after 1978. At that time, it had been down to 10 percent after a precipitous fall during most of the 1970s (liquidation of the remaining private peasant farms in the Slovak hill areas). The 13 percent attained by 1982 implied an increase also of the absolute numbers by one-fifth compared to only two years earlier.

In Southeast Europe, private animal husbandry is still a major component of socialized agriculture. Hungary and, beginning by the mid-1970s, also Bulgaria, rather successfully put its potential to use. Both no longer have upper limits fixed for livestock numbers in private ownership, except that such husbandry must not be exercised to the detriment of the socialist sector. But the insistence on control over such private activities and on the marketing of their produce through cooperative or state trade and procurement seems to be much less in Hungary. The Romanian government is also intent on taking advantage of the private sector's productive potential, of its animal production in particular, but has yet been more eager than the Bulgarian government to control and command it at the same time. Most of the incentives offered along such lines in Romania seem to have little effect.[18]

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[17] These and the following data are derived from the CMEA statistical annual (*Statisticheskiy . . .*) by deducting state and collective farm from total output, whereas the livestock numbers are indicated directly in that source. Some minor overstatements of private output are possible to the degree that some institutional non-private producers, e.g., subsidiary fattening sections of industrial or communal enterprises, may not be subsumed under the public agriculture sector farms. In the case of the GDR, the national and CMEA statistics combined yield the full numbers of animals in private ownership, but not such output.

By 1985, official Czech data are available up to 1981 (including— in *Zemedelska Ekonomika*, no. 7, 1983. They show the share of private animal output at 10.6 percent in 1981 (8.5 percent for crops, and 9.7 for total agr. output). Very likely, the shares have increased since then and should attain about 15 percent for animal and slightly less for total agr. output, in 1984.

[18] For the preceding, see, among others, *The Situation of Small Scale Farming in Hungary and its Development*, Budapest 1978, and *The Part of Hungarian Small-scale Farming in Production, Employment, Standard of Living, and Way of Life*, Budapest 1982 (*Research Institute for Agricultural Economics, Bulletin*, nos. 43 and 5; Henry Spetter, "The Role of the Legal Private Sector in the Bulgarian Economy", Radio Free Europe Research, vol. 8, no. 31 (Munich, July 29, 1983); Romanian Situation Report 7, *Radio Free Europe Research*, Apr. 18, 1983, pp. 23–25.

Generally, private subsidiary livestock raising chiefly concentrates on meat production, while private milk production is declining even in Hungary—but not so in Bulgaria and Romania; in the latter country, it has been expanding in both absolute and percentage terms. Private egg production did equally well in Bulgaria and Romania, while in Hungary it expanded only in absolute quantity and slowly. On the basis of the animal numbers, one may estimate that in Hungary 45–50 percent of all cattle and pigs for slaughter are raised privately, and total animal production probably is not far off that same mark (milk 28, eggs 61 percent in 1982).[19] A similar Romanian percentage was indicated for 1978 (see footnote 16) and is unlikely to have decreased since then—rather it has probably increased. In Bulgaria, the private sector's share expanded within a fast growing overall livestock sector; its reported absolute growth rate from 1970 to 1982 seems impressive, yet the available data may contain some overstatement (cf. footnote 17 and 18, above). At any rate, it obviously has expanded faster than the socialized part of agriculture, and, in animal production, not in overall agricultural production, seems to have achieved a share of close to 40 percent by 1982 (40 percent for meat, 27 for milk, 55 for eggs, 32 for wool), as against the official estimate of 1972, which put it at 30.3 percent. In crop production, too, the share has increased over the 12.9 percent of 1972, so that the overall percentage in 1982 was about 25.[20] This growth seems to be due not just to a more liberal policy, but also to the official proclamation (1977) of the goal of local self-sufficiency in rural areas. Surely, it does not seem to be connected with the formation of the giant "agro-industrial complexes" of the early 1970s in Bulgaria, whose extreme forms were abolished by the mid-1970s, when the rise of the private sector recommenced.

Perhaps the most amazing fact about the private livestock sector in Southeast Europe is its fast growing productivity per animal, as demonstrated by the indirect evidence on milk yields per cow. Except for Romania, the milk yield during 1971–82 has been above average in the public sector, but its increase was faster in agriculture at large. Thus, the rise in the private sector must have been faster. In Romania, the gap between the two yield figures widened in favor of the non-public sector.

TABLE 7.—MILK YIELDS PER COW, 1970 AND 1982 (KILOGRAMS PER YEAR) [1]

| | Poland | Yugoslavia | Bulgaria | Hungary | Romania | CSSR |
|---|---|---|---|---|---|---|
| 1970, total average | 2,456 | 1,219 | 2,211 | 2,252 | 1,607 | 2,565 |
| Of which: public farms | 2,944 | 3,764 | 2,808 | 2,489 | 1,693 | ..... |
| 1982, total average | 2,658 | 1,632 | 2,945 | 4,149 | [2] 1,832 | 3,199 |
| Of which: public farms | 2,931 | [2] 4,775 | 3,316 | 4,545 | [2] 1,436 | 3,498 |

[1] Data for the GDR are not available in a meaningful way.

[2] 1981.

Sources: Statisticheskiy ezhegodnik stran-chlenov SEV, 1983, p. 218; 1984, pp. 197–8 and—for Yugoslavia—Statisticki godisnijak Jugoslavije, 1982, p. 244, and 1983, p. 158.

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[19] According to *Statisticheskiy* . . ., pp. 206 and 209, the share of privately owned pigs stayed at 52 percent in Hungary after 1977, while that of cattle went down from 38 to 21 percent during 1970–82.

[20] *Statisticheskiy Godishnik na Narodna Respublika Bulgaria*, 1973, p. 214, and *Ikonomicheski Zhivot*, February 23, 1983, 1 (as quoted by Henry Spetter, op. cit., p. 2).

The advantages of the private sector are based not only on the personal interest and care involved, but to a considerable extent also on the availability of labor and of long amortized small premises and implements as well. For general demographic reasons, the size of such a private labor force has been declining, the facilities are deteriorating with the passage of time (or will be expensive to rebuild), and, as the public sector very likely will slowly improve its performance, these comparative advantages will lose importance, although private initiative may still ensure some superiority. In addition, one does not yet see—perhaps except for Hungary—private production and marketing being truly liberalized, nor being put on an equal footing with the public sector. As long as this does not occur, the private output volume will not exceed certain limits, which may have already been reached. If all the restrictive rules are in fact abolished, increases may continue, but that day may be far off. Even if it holds its absolute level, the private sector is unlikely to increase further its percentage share. In crop production, a shift in flexibility and production towards highly priced specialized products may make the private sector more important for a time, but probably at the expense of animal production and accompanied by a change towards more non-agricultural and urban individual producers.

## VII. Non-Transferability of the "Hungarian Model"

The numerous measures of the various governments for reorganizing socialist large-scale farming, inclusive of incentive systems, cannot be dealt with here. But a few words need to be said concerning the wide-spread talk, in the East and West, about the "Hungarian Model" and the possibility of transferring it to other CMEA countries. There can be no doubt that Hungarian agriculture has done much better than that of the other East European countries, whether collectivized or not. However, considerations of emulation as published in the East, and as far as they have come to the present writer's knowledge, never mention duplicating that model as a whole. Rather, individual elements of it are referenced, or the question is raised as to which of the specific Hungarian mechanisms are suited for adaptation.

Whatever the merits would be of such partial steps, one can hardly expect them to yield the same results as in the Hungarian setting. That country's "model" represents a whole of interrelated measures, which in their total come close to what indeed might be called a reform within a Communist system, and, at the same time, they are specifically Hungarian in several of their aspects.

Neither the tolerance towards the private sector, nor the opening up of cooperation with Western firms, which has led to the widespread adoption of Western technology and the spreading of technological innovation through technical package systems such as the so-called production systems partly in cooperation with those firms, nor the flexible ways in entering export markets are alone sufficient explanations of the Hungarian success. There are other elements of great importance that allowed for the successful application of these approaches: abstention from setting plan targets in physical units and substituting them with highly aggregated, annually corrected and not absolutely mandatory ones, combined with leaving considerable decision-making powers to farm managers and concomitant decentralization. In that same sense, a sizable decompression of the domestic political atmosphere, exceeding that of any other CMEA country (though not of Yugoslavia), also exerted a positive influence, which cannot be quantified but must have been considerable. Last but not least, this rather consistent reform policy has been continued for roughly two decades (it was introduced in the collective farm sector before the reforms were officially proclaimed in 1967), with only short-lived and not too strong leanings towards "tightening the reins" in between. Thus, most of the people concerned, from farm manager to simple collective farmer, by now probably feel that the agrarian policy is permanent and reliable; however, efforts at liberalization and decentralization have so far been less in the state farm sector or in the industrial linkages of agriculture as well as in the economy at large. Thus, the mere fact of a state farm sector occupying some 30 percent of total agricultural land (as in Romania and Czechoslovakia), instead of the Hungarian 15 percent, might make an application of the "model" different in these countries.

One could enumerate more specifically political and cultural factors particular to Hungary of the recent or more remote past that have contributed to the evolution of the Hungarian "model," but one thing still seems certain: at present, it is hard to imagine any other country of the CMEA, possibly excluding Yugoslavia, going to similar lengths in changing and liberalizing not only the economic system but to some degree the domestic atmosphere, while keeping the political system intact.

## VIII. OUTLOOK FOR THE 1980s

With the prospects for fundamental systemic reforms being bleak for the foreseeable future, it seems inevitable that agricultural production in Eastern Europe:

Will need more capital inputs, as a substitute for raising capital productivity through reform, than the economy at large can afford;

Will therefore continue its sluggish growth, instead of the needed faster growth;

Will become ever more expensive all the same, as the cost of material inputs and labor will increase beyond what the increase of total factor productivity would allow; and

Will suffer from the shortcomings of its non-agricultural linkages at least as much as from its own weaknesses.

More specifically, the northern three countries of Communist East Europe will remain major importers of feedstuffs and exporters of limited quantities of animal products. Poland, although having the potential for self-sufficiency in food and for large net exports of animal products, will under the present regime and socio-economic depression hardly achieve such a stage during the 1980s. Southeast Europe, less densely populated and still predominantly agrarian in large regions, will surely be capable of becoming a major exporter of animal products as well as of grain on a net basis, along with exports of vegetables, fruit, wine, tobacco and the like. Hungary and—to a lesser degree—Bulgaria are already exploiting that potential, but, even in the notable case of Hungary, a limit may be reached, beyond which growth will be slower or more expensive. Imports of oilseeds and other high protein feedstuffs will continue throughout Eastern Europe.

It is not impossible that Romania and Yugoslavia will reach the stage of permanent net exporters towards the end of the present decade. The absolute growth of their agricultural output has been quite respectable in the past, and the potential contribution of their still existing labor surpluses on under-capitalized farms ought to be kept in mind for the future. Moreover, their high population growth and the part of domestic food demand that is generated by it, started declining in the late 1970s.

A recovery of Southeast European agriculture was witnessed in 1982, so that, even with the drought inflicted setback of 1983 in all four countries, production growth over 1980 by now may figure at an annual average of 1-2 percent. It does not seem impossible that they will somewhat catch up and revert to their 1970-80 mid-term average growth. In that case, the overall Southeast European agricultural growth rate might again reach 2-3 percent or so for end-use output. Together with declining population growth that should permit slowly improving foreign trade balances in food, although not exports of quantities that sizably influence the world markets.

# IV. THE DEFENSE SECTOR

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## OVERVIEW

By John P. Hardt and Donna L. Gold*

The Soviet extensive growth model, which called for the establishment of an industrial base led by the production of iron and steel, machinery, and energy, served as the prototype for East European civilian industry during the fifties and early sixties. The defense industries of the CMEA-Six** were also patterned after the standard Soviet model, with Moscow probably dictating defense levels and standardization of military production to ensure that the requirements and goals of the Warsaw Pact were met. This priority, accorded to basic and defense-related industries for more than a decade, was sustained at the expense of the development of light industries, infrastructure, and agriculture.

By the late 1960s, the CMEA-Six began moving toward a new economic strategy of intensive development that required greater attention to factor productivity and output quality. Modernization, consumerism, and foreign trade were the key criteria for the new industrial policy adopted in varying degrees throughout Eastern Europe. Although the emphasis of this policy was on the upgrading of the civilian economy, the military-industrial sector continued to enjoy high priority. As Montias and Brada wrote regarding Poland: "(I)t would be naive to overlook the potential role of the military in obstructing the policy of 'selective development.' . . . Would the decision makers representing Poland's military interests have been satisfied with a new order of priorities which would have directed some of the country's scarcest resources to export industries?" [1]

The size of the military's claim on the resources of the economies of Eastern Europe since 1970 has been examined by Thomas Clements and Thad Alton. In an historical perspective of the defense costs of the Non-Soviet Warsaw Pact (NSWP) countries,[2] Clements has found that:

(1) Since 1970, the total defense budgets in current prices grew at a composite rate averaging about 6 percent a year.

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**The Council for Mutual Economic Assistance or COMECON is the economic alliance of the Eastern bloc. The CMEA-Six consists of: Bulgaria, Czechoslovakia, East Germany (GDR), Romania and Hungary.

[1] J. Michael Montias and Josef C. Brada, "Industrial Policy in East Europe: A Comparison of Poland, Czechoslovakia, and Hungary," infra., p. 207.

[2] This section is drawn from "The Costs of Defense in the Non-Soviet Warsaw Pact: A Historical Perspective" by Thomas W. Clements.

(2) A profile of the estimated defense costs in current prices, based on NSWP averages for 1970–81 reveals that:

(*a*) the overall defense share of the region's GNP was 3.5 percent;

(*b*) the total defense costs consisted of a 40-percent share for investment (procurement, construction, and research and development) and a 60-percent share for operating (personnel and operations and maintenance);

(*c*) the total costs grew at an average annual rate of 7 percent, compared to 2-percent growth in constant-price terms.

(3) For 1981, the estimated total cost of the collective NSWP defense programs is $32 billion in 1981 prices.

By comparison, Soviet defense expenditures increased by about 4 percent from 1970 to 1976 and by about 2 percent from 1976 to 1981. The defense share of Soviet GNP was approximately 14 percent during the same time period that Clements reports that the defense share of the overall CMEA-Six GNP was 3.5 percent.

Clements has made three types of analyses: First, he has looked at the official defense budgets published by the individual countries. Although lacking in sufficient detail to serve as measures of defense costs, these official statistics are useful for identifying trends. Principal among these trends is the continuous growth of the budgets, discussed under number 1 above, which Clements finds "tracks closely not only with the pace of military activity and inflation but also with the current price-trends in the region's gross national product." He goes on to conclude that "(t)he apparent relation between the trends in the defense budget and GNP supports the belief that information on economic performance, in conjunction with detailed plans in force requirements, is a key element in the decisionmaking process for determining the level and rate of growth of military spending."

Second, Clements has estimated defense expenditures in terms of indigenous currencies. The reason for such an estimate, he explains, is that they "permit general assessments of the share of the economic output allocated for the military, the relative priorities of defense programs, and the economic impact of resource flows to the armed forces." In his estimate, Clements has used the building-block method. This method involves identifying the physical components of all NSWP military efforts and then individually costing them. Because of limited data, components pertaining to procurement, construction and operations are first costed in dollars and then converted into indigenous currencies. Other components, such as personnel costs and R&D costs, are costed directly in indigenous currencies. Clements' major findings using this second type of analysis are listed under number 2 above.

Finally, Clements has made a dollar estimate of NSWP defense programs. Once again the building-block approach is used. The reason for this type of estimate, according to Clements, is "to portray the overall size of the NSWP defense programs in a manner that is meaningful to Western observers. These monetary measures of defense activity are based on the use of the dollar as a common denominator for aggregating the dissimilar physical components of each nation's military effort, an approach that considers both the quantitative and qualitative features of the armed forces." Number

3 above describes the primary result of Clements' dollar cost estimate.

Using a different methodology that relies on officially published defense appropriations, Thad Alton has also made some cost estimates of East European defense expenditures in terms of both indigenous currencies and U.S. dollars.[3] His basic findings are similar to those of Clements. In addition, he has made some revealing comparisons between East European, Soviet, and American defense expenditures:

(1) The military effort of the six East European countries covered in this study is substantial: their number of regular active, well-disciplined forces amounts to more than one-half of that of the United States.

(2) Even in terms of the narrowly defined official defense budgets, the military expenditures of the six East European countries as a group amount to more than one-fifth of the total defense outlays of the United States in terms of U.S. dollars.

(3) East European expenditures, although smaller than those of the U.S.S.R. in absolute total and in shares of GNP, constitute a significant contribution to the Warsaw Pact and have tended to rise at roughly the same pace as those of the U.S.S.R.

(4) For the decade of 1965-75, this pace exceeded the rate of increase in United States defense expenditures. There was a moderate deceleration of increase rates in 1975-80, then a sharp increase in 1981-82.

According to Alton, there is evidence that the official defense budgets of the East European countries are too low. He sees two basic reasons for this understatement: The first has to do with the prices paid by the defense industries as compared to normal prices; the second with the wide range of items omitted from the official defense budgets that are financed partially or entirely by agencies and ministries other than the ministry of defense.

Turning to the issue of prices, Alton explains that: "purchases of the ministry of defense are not subject to the general price regulations and that the defense ministry can set its procurement prices directly or by a different set of regulations." Furthermore, any differences between production costs and the prices paid by the military may be assumed by subsidies from non-defense agencies. "These pricing policies imply substantial underestimation of the 'real cost' of military spending when expressed as a percentage of GNP at market prices in domestic currencies."

In looking at military-related items that are left out of the defense budget, Alton suggests that there are twelve categories. Naming a few:

(1) Certain military units, such as border guards, security troops, construction troops, and transport troops, that may be financed partly or fully from the budgets of the ministries of internal affairs, ministries of security, ministries of construction, ministries of transport, or some other agencies other than the defense ministry.

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[3] This section is drawn from "East European Defense Expenditures, 1965-1982" by Thad P. Alton, Gregor Lazarcik, Elizabeth M. Bass and Krzysztof Badach.

(2) Paid leave to reservists while on military exercises, which are as a rule financed by the reservists' civilian employers from their own funds.

(3) Severence pay to conscripts for several weeks at the beginning of their military service, financed by their civilian employers.

(4) Costs of travel of conscripts and reservists to and from the place of military service, exercises or training, which may be borne by the transport ministries or local governments.

Alton's work, like that of Clements, contributes to Western understanding of the magnitude of East European defense efforts as well as of the impact that these expenditures have on the economies of Eastern Europe. Defense costs, however, are the least measurable components of the budgets of centrally planned economies. Problems with data availability and methodologies continue to leave academics as well as policymakers with, in Thad Alton's words, "impression(s) of the military expenditures of these countries," rather than accurate, reliable estimates. Still, it seems clear that the relative shares of military resources have been high and growth has been significant.

# THE COSTS OF DEFENSE IN THE NON-SOVIET WARSAW PACT: A HISTORICAL PERSPECTIVE

By Thomas W. Clements*

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## SUMMARY

**The analysis of available military-economic information provides some insight into the costs of defense in the six East European na-**

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*Defense Intelligence Agency.

tions of the non-Soviet Warsaw Pact (NSWP). This report summarizes the key judgments drawn from published data on the NSWP official defense budgets and from detailed cost estimates of the major identifiable NSWP defense programs.

The NSWP official defense budgets, though published with very few details, are useful for measuring the nominal military spending trends, which include elements of both real growth and inflation. Since 1970, the total defense budgets in current prices grew at a composite rate averaging about 6 percent a year. This trend is consistent with the observed developments in the armed forces and with the apparent increases in the general level of prices in the economy, and tracks closely with the nominal growth in the region's gross national product (GNP), a finding which supports the belief that economic performance is a key determinant of military spending levels.

Supplementing the official defense budgets are fairly detailed estimates of NSWP defense costs in indigenous currencies. The cost estimates, defined and arranged in terms suitable for comparison with data on the military expenditures of the US, represent the actual Ministry of Defense (MOD) outlays associated with the manning, supply, and operation of the NSWP armed forces. A profile of the estimated defense costs in current prices, based on NSWP averages for 1970–81, reveals that: the overall defense share of the region's GNP was 3.5 percent; the total defense costs consisted of a 40-percent share for investment (procurement, construction, and research and development) and a 60-percent share for operating (personnel and operations and maintenance); and the total costs grew at an average annual rate of 7 percent, compared to 2-percent growth in constant-price terms.

The NSWP leaders probably review military spending figures that are broader in scope than either the official defense budgets or the estimated defense costs, data sets which consider only the MOD outlays. To calculate the full impact of defense on the economy, NSWP planners may also compile information on the costs of other military-related programs, such as investment in the defense industry and the stockpiling of strategic raw materials. These costs may be large and could substantially add to the conventional calculations of the NSWP defense burden.

While the defense cost data in indigenous currencies are relevant for assessing the East European perspective of military spending, the estimated dollar costs are used to gauge the size of the NSWP military effort in terms that are familiar to US policymakers. For 1981, the estimated total cost of the collective NSWP defense programs is $32 billion in 1981 prices. This dollar estimate accounts for the costs of the obvious investment and operating programs, but excludes those related to military R&D. For the period 1970 to 1981, the total dollar cost increases in real terms at a rate averaging nearly 2 percent a year, growth that is largely the result of force modernization activities.

## 1. INTRODUCTION

This report discusses the costs of defense in the six East European nations of the non-Soviet Warsaw Pact (NSWP): Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania. The discussion evaluates the NSWP official defense budgets and presents estimates of NSWP defense costs in both indigenous currencies and US dollars.

## 2. THE NSWP OFFICIAL DEFENSE BUDGETS

### *a. Levels*

The official defense budgets represent the primary source of published information on the costs of the NSWP military efforts (table 1—"NSWP: Official Defense Budgets, 1970–83"). The defense budgets are expressed in terms of current prices and, therefore, include elements of both real growth and inflation. The budget cycle for defense appropriations coincides with the calendar year.

TABLE 1.—NSWP: OFFICIAL DEFENSE BUDGETS, 1970–83

[Indigenous currencies, current prices]

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | Average annual growth rate 1970–83 (percent) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulgaria (million leva) | 324.0 | | | | | | | | | | | | | | |
| Czechoslovakia [1] (billion crowns) | 14.9 | 15.9 | 16.8 | 17.5 | 18.1 | 19.7 | 20.4 | 20.1 | 20.8 | 21.4 | 22.9 | 23.1 | 21.3 | 23.8 | 3.7 |
| East Germany [1] (billion marks) | 6.7 | 7.2 | 7.6 | 8.3 | 8.9 | 9.6 | 10.2 | 11.0 | 11.6 | 12.1 | 13.1 | 14.2 | 15.0 | 15.9 | 6.9 |
| Hungary (billion forints) | 9.8 | 9.9 | 9.4 | 9.5 | 10.6 | 11.8 | 11.7 | 12.6 | 15.0 | 14.9 | 16.4 | 18.0 | 20.1 | 21.0 | 6.0 |
| Poland [2] (billion zlotys) | 35.7 | 37.7 | 39.5 | 42.3 | 46.4 | 50.2 | 54.2 | 60.9 | 63.3 | 65.3 | 70.4 | 75.2 | 82.1 | 89.1 | 7.3 |
| Romania (billion lei) | 7.1 | 7.4 | 7.7 | 7.8 | 8.7 | 9.7 | 10.6 | 11.0 | 11.7 | 11.8 | 10.5 | 10.4 | 10.8 | 11.7 | 3.9 |

[1] These budget figures also include appropriations for internal security.

[2] The budget figures for 1982 and 1983 are estimates based on Polish data published in March 1983. Following an apparent major price revision in 1982, Poland announced data on the total national defense outlays—for 1982, 77 billion zlotys (bz.) in old prices and 176 bz. in new prices; for 1983, 191 bz. in new prices. This information was used to construct a growth index for the national defense outlays during 1981–83. The index was then applied to the last reported amount for the MOD budget (75.2 bz in 1981) to derive the 1982–83 figures appearing in the table.

Source: For 1970–81, statistical yearbooks of the respective countries. For 1982–83, official announcements in the East European literature.

Most NSWP nations annually announce their total defense budget in the news media. These announcements usually cite the planned defense appropriation as a component of the government budget for the next fiscal year. Subsequent reporting in the East European statistical yearbooks generally provides a figure that represents the actual defense expenditure.

Bulgaria is the only nation that presently refrains from announcing its defense budget, a practice that culminates an apparently progressive effort to conceal data on military spending. For the period 1946–62, the Bulgarian government regularly reported annual figures for the total defense budget. From 1963 to 1970, the reporting was limited, however, to only a statement of the percentage share of the state budget allocated for defense. Beginning in 1971, the government adopted a new policy of referring to military spending in vague terms, with no mention of absolute amounts or relative shares. For example, Bulgaria's Finance Minister stated in his 1982 report to the National Assembly that "The draft state budget also provides the necessary means for the defense and security of our country." [1]

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[1] Joint Publications Research Service, East European Report: Economic and Industrial Affairs, No. 2225, National Technical Information Service, Washington, 28 January 1982, p. 8.

*b. Details*

The content of the contemporary NSWP defense budgets is a state secret, and published information on their composition is limited to the partial disclosures of three nations (figure 1—"NSWP: Published Details of Official Defense Budgets, 1981").

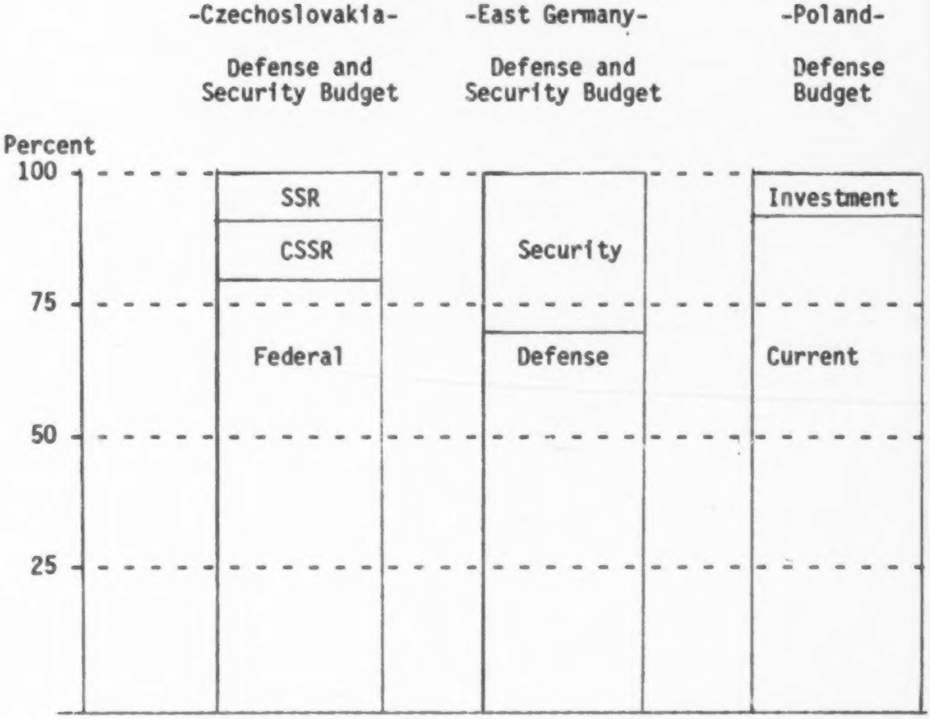
—Czechoslovakia announces a budget figure that shows planned federal and republic outlays for Defense and Security. While the nomenclature suggests that outlays for border guards and police are included in the budget, no amounts are given for these components.

—East Germany also reports a figure for Defense and Security, and for the past 7 years has shown the share of the total defense appropriation allocated for internal security forces. Although this share is large, about 30 percent, a major portion of the budget remains unexplained.

—Poland publishes a breakdown of the defense budget that shows only aggregated figures for two outlay categories: Current, for which there is no explanation in the open literature; and Investment, which probably includes outlays only for the construction of military facilities.

Figure 1

NSWP: Published Details of Official Defense Budgets, 1981



NOTE: Based on data in indigenous currencies and 1981 prices.

SSR - Slovak Socialist Republic
CSSR - Czech Socialist Republic

Source: Statistical Yearbooks of the respective countries.

The lack of detailed data on the defense budgets makes it difficult to judge their validity as measures of military spending, and thus complicates the analysis of NSWP priorities and intentions.

Some insight into the general scope of the present-day official figures, however, is provided by available information on the Czechoslovak and Polish defense budgets during the late 1940s (table 2—"Czechoslovakia: Published Details of the Budget for the Ministry of Defense, 1946"; table 3—"Poland: Published Details of the Budget for the Ministry of Defense, 1949"). Following World War II, Czechoslovakia and Poland published detailed accounts of the state budget allocation for defense. This literature reveals that the Czechoslovak defense budget in 1946 and the Polish defense budget during 1947-49 included appropriations for the major investment and operating categories—procurement, construction, personnel, and operations and maintenance (O&M). Further, the basic content of these budgets corresponds to the known coverage of the Soviet official defense budget during 1941-45, which then also included most military outlays.[2] Although there have been no further revelations on the details of the Warsaw Pact announced military appropriations, the continued growth in the Czechoslovak and Polish published figures suggests that their composition has not changed greatly, unlike the eventual leveling and decline of the published Soviet official defense budget.

TABLE 2.—CZECHOSLOVAKIA: PUBLISHED DETAILS OF THE BUDGET FOR THE MINISTRY OF DEFENSE, 1946

| Budget title | Billion crowns | Percent |
|---|---|---|
| Ministry of National Defense | .1 | 1.6 |
| National defense | 5.8 | 92.0 |
| Personnel | (2.0) | (31.7) |
| Provisions, outfittings, and inventory | (1.2) | (19.0) |
| Technical weapons and armaments procurement | (1.8) | (28.6) |
| Housing | (.3) | (4.8) |
| Other | (.5) | (7.9) |
| Military missions | ([1]) | ........ |
| Military social care | .3 | 4.8 |
| Liquidation of war obligations | .1 | 1.6 |
| Total | 6.3 | 100.0 |

[1] Negligible.

Source: Czechoslovakia, National Assembly, Sbirka zakonu a narizeni republiky Ceskoslovenske, No. 59, Prague, 1946, pp. 340-343—as discussed by T.P. Alton, et al., Working Papers-Military Expenditures in Eastern Europe: Estimates, Analyses, and Problems, New York, September 1976, pp. 11-18.

TABLE 3.—POLAND: PUBLISHED DETAILS OF THE BUDGET FOR THE MINISTRY OF DEFENSE, 1949

| Budget item | Billion zlotys | Percent |
|---|---|---|
| Maintenance of troops | 27.3 | 45.1 |
| Training | 2.2 | 3.6 |
| Cultural-educational purposes | .5 | .8 |
| Maintenance of equipment, arsenals, and shops | 2.2 | 3.6 |
| Procurement of military equipment and ammunition | 3.8 | 6.3 |

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[2] For information on the content of the Soviet official defense budget during 1941-45, see F. Doe, in US Congress, Joint Economic Committee, Soviet Military Economic Relations, U.S. Government Printing Office, Washington, 1983, pp. 158-179.

TABLE 3.—POLAND: PUBLISHED DETAILS OF THE BUDGET FOR THE MINISTRY OF DEFENSE, 1949—Continued

| Budget item | Billion zlotys | Percent |
|---|---|---|
| Navy | 3.8 | 6.3 |
| Academy of Physical Education | .2 | .3 |
| Troops of internal security | 7.8 | 12.9 |
| Chief Inspectorate of Border Protection | 4.6 | 7.6 |
| Special military outlays | 4.0 | 6.6 |
| Investment outlays | 4.1 | 6.8 |
| Total | 60.5 | 100.0 |

Note.—Values are expressed in old zlotys (1 old zloty = .03 new zlotys).

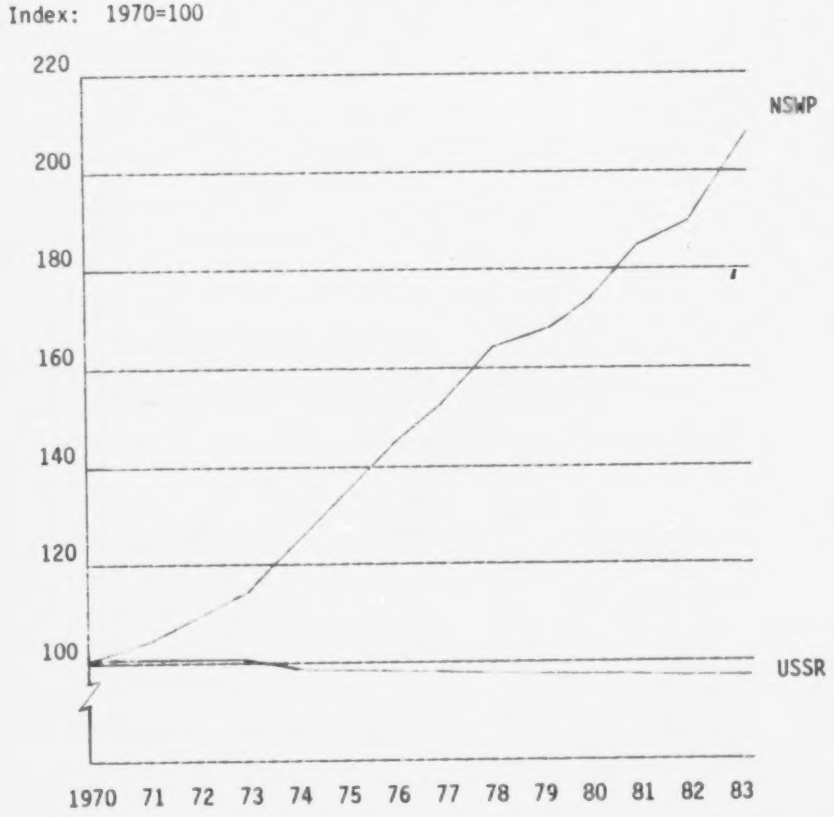
Source: Dziennik Ustaw, No. 22, Apr. 19, 1949, pp. 378–379—as discussed by T.P. Alton, et al., Working Papers-Military Expenditures in Eastern Europe: Estimates, Analyses, and Problems, New York, September 1976, pp. 62–70.

### c. *Trends*

Since 1970, there has been considerable growth in the NSWP defense budgets (figure 2—"Warsaw Pact: Trends in Official Defense Budgets, 1970–83"). From 1970 to 1983, the defense budgets in current prices increased at an overall average annual rate of about 6 percent. This rising trend is in sharp contrast to the declining published Soviet official defense budget, a figure known to exclude major categories of military spending. While the NSWP defense budgets probably also exclude some outlays, the long-term growth in these figures is consistent with observed developments in defense programs and with general inflation rates apparent in the economy, thus suggesting that the official data roughly reflect actual trends in total military spending by the Ministries of Defense (MODs).

Figure 2

Warsaw Pact: Trends in
Official Defense Budgets, 1970-83



NOTE: Based on data in indigenous currencies and current prices.

The composite NSWP index is a weighted average, with the weights being derived from the distribution, by country, of the estimated total dollar cost of the NSWP defense programs in 1981. The index excludes Bulgaria, which ceased publication of information on the defense budget in 1971.

Source: Statistical Yearbooks of the respective countries.

The growth in the defense budgets since 1970 tracks closely not only with the pace of military activity and inflation but also with the current-price trends in the region's gross national product (figure 3—"NSWP: Average Annual Growth Rates for Official Defense Budgets and GNP, 1970–75 and 1976–81"). For four of the NSWP nations (Czechoslovakia, East Germany, Poland, and Romania) the growth rates for the defense budgets during 1976–81 are lower than those for 1970–75, a pattern similar to the trends in the GNP. For Hungary, an upturn in defense budget growth for the late 1970s matches a rise in the GNP trend. The apparent relation between the trends in the defense budget and GNP supports the belief that information on economic performance, in conjunction with detailed plans on force requirements, is a key element in the decisionmaking process for determining the level and rate of growth of military spending.[3]

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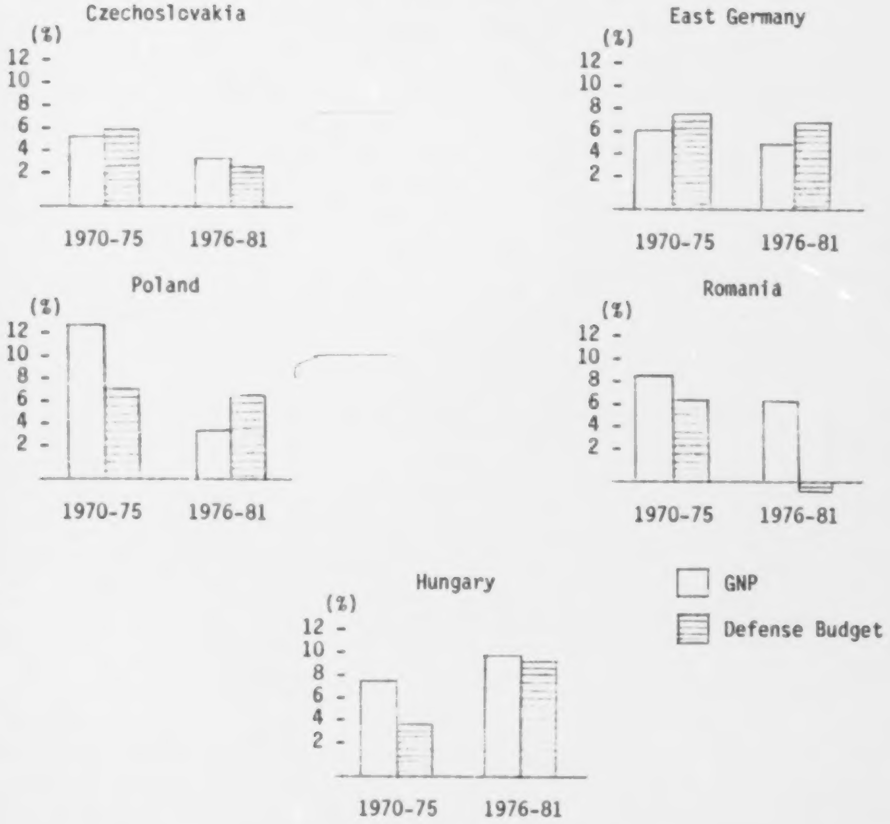
[3] The nominal GNP growth rates, while not appropriate for measuring annual changes in economic performance, probably are valid as indicators of general shifts in the underlying real economic trends.

Figure 3

NSWP: Average Annual Growth Rates for
Official Defense Budgets and GNP,
1970-75 and 1976-81



NOTE: Based on data in indigenous currencies and current prices.

Source: Statistical Yearbooks of the respective countries, for the official defense budgets.

T.P. Alton, et al., for the estimates of East European gross national product.

Public statements by NSWP officials illustrate their awareness that the development of a strong defense sector requires a firm economic foundation. For example, President Nicolae Ceausescu announced in 1978 that Romania must "achieve a balance and an adequate ratio between the growth of the national income and the rise in military spending." [4] A year later, Romania's defense minister stated in a speech to army representatives that "the fatherland's defense capability is firmly based on rapid socioeconomic development, and the measures adopted concerning national defense should not hamper the integral fulfillment . . . of the program for building the comprehensively developed socialist society and raising the people's material and cultural levels." [5] Consistent with these statements, Romania reported reductions in the defense budget during 1980–81, explaining that additional funds were being shifted to the civil sector to improve the standard of living.

### 3. ESTIMATES OF NSWP DEFENSE COSTS

To supplement the data available on the official defense budgets, detailed estimates of the annual NSWP defense costs have been prepared for each nation for the 1970–81 period. The cost estimates are expressed in indigenous currencies to replicate the kind of information reviewed by NSWP leaders and military planners, and in dollars to provide data that are meaningful to US policymakers. The current-price series, based on values in indigenous currencies, attempt to reconstruct the actual payments made by the MODs in each year, whereas, the constant-price series, calculated in both indigenous currencies and dollars, yield cost trends resulting from estimates of changes in the size of the major defense programs. The cost estimates presented in this report may represent minimum levels, because they account only for the obvious defense activities.

#### *a. Costs in indigenous currencies*

##### *(1) Utility of cost estimates*

The estimates of NSWP defense costs in indigenous currencies are useful for analyzing each nation's military effort within the context of the internal economy. The cost estimates permit general assessments of the share of the economic output allocated for the military, the relative priorities of defense programs, and the economic impact of resource flows to the armed forces.

Because the cost estimates are well-defined and standardized, they can also be used in international comparisons of defense costs.

—The estimates conform to the basic US definition of military spending. This definition includes outlays for investment programs (procurement, construction, and R&D) and operating programs (personnel and O&M). The present analysis includes regular active-duty troops for the army, air force and navy, but excludes paramilitary troops—such as border guards, internal security police, civil defense personnel, construction troops, and reservists.

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[4] Foreign Broadcast Information Service, Daily Report: Eastern Europe, National Technical Information Service, Washington, 21 December 1978, p. H6.

[5] Foreign Boradcast Information Service, Daily Report: Eastern Europe, National Technical Information Service, Washington, 30 November 1978, p. H12.

—The estimates reflect monetary valuations that are based on a systematic consideration of the East European price structures for defense goods and services. These valuations stem from an analysis of the actual prices paid by the MODs for manpower and equipment, and on studies relating the purchasing power of the US dollar to the currencies of the East European economies.[6]

### *(2) Method to estimate costs*

A building-block method is used to estimate each nation's defense costs in indigenous currency. This approach entails identifying and listing all physical components of the NSWP military efforts. The costs of those components associated with procurement, construction, and O&M are determined initially in dollars because of limited information on East European military prices, and then are expressed in indigenous values by using currency conversion factors.[7] The costs for personnel and R&D are derived directly in indigenous currencies-personnel, using available data on military manpower strengths and pay scales; and R&D, using published East European data on the science budgets.

### *(3) Results*

Using the building-block method it is possible to provide an overview of the estimated costs (in indigenous currencies and current prices) of the NSWP military effort during the period 1970 through 1981.

—The total defense costs amounted to an overall average share of 3.5 percent of the region's gross national product.

—The military investment costs (procurement, construction, and R&D) accounted for an average share of 40 percent of the total defense costs, while the operating costs (personnel and O&M) accounted for the remainder.

—The total defense costs grew at an average annual rate of about 7 percent, and by just over 2 percent a year in constant prices.

The indigenous-currency estimates are presented as NSWP composites because there is more confidence in the aggregates than in the details.[8]

### *(4) Official defense budgets vs. estimated defense costs*

A comparison of the NSWP official defense budgets with the estimated defense costs offers an explanation of the meaning of the announced data (figure 4—"NSWP: Financial Flows to Defense, 1981"). For 1981, the estimated costs for four NSWP nations Czechoslovakia, Hungary, Poland, and Romania) are higher than the budgets by an average of only 15 percent, a discrepancy that may be due to differences in coverage.[9] Apparently, the defense budgets are adequate in magnitude to finance most outlays for personnel, O&M, procurement from indigenous production, and construction. Outlays for procurement from imports, R&D, and pensions, however, may be funded from the state budget accounts for trade, science, and welfare, respectively. Despite such possible differences in the coverage of the two sets of data, the nominal trends in the official budgets and the estimated costs are similar, with both totals (in current prices) growing at average annual rates of 6 percent and 7 percent, respectively, during 1970–81.

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[6] This report considered the following studies on the subject of purchasing power parity: Irving B. Kravis, Zoltan Kenessey, Alan Heston, and Robert Summers, A System of International Comparisons of Gross Product and Purchasing Power-Phase I, Johns Hopkins University Press, Baltimore, 1975; Irving B. Kravis, Alan Heston, and Robert Summers, International Comparisons of Real Product and Purchasing Power-Phase II, Johns Hopkins University Press, Baltimore, 1978; Irving B. Kravis, Alan Heston, and Robert Summers, World Product and Income: International Comparisons of Reel Gross Product-Phase III, Johns Hopkins University Press, Baltimore, 1982.

[7] These conversion factors have been developed from GNP parities prepared by T.P. Alton, et al., Working Papers: East European Defense Expenditures, 1970–79, New York, 1981, pp. 54–56.

[8] The composite figures are weighted averages, with the weights being derived from the distribution, by country, of the estimated total dollar cost of the NSWP defense programs in 1981.

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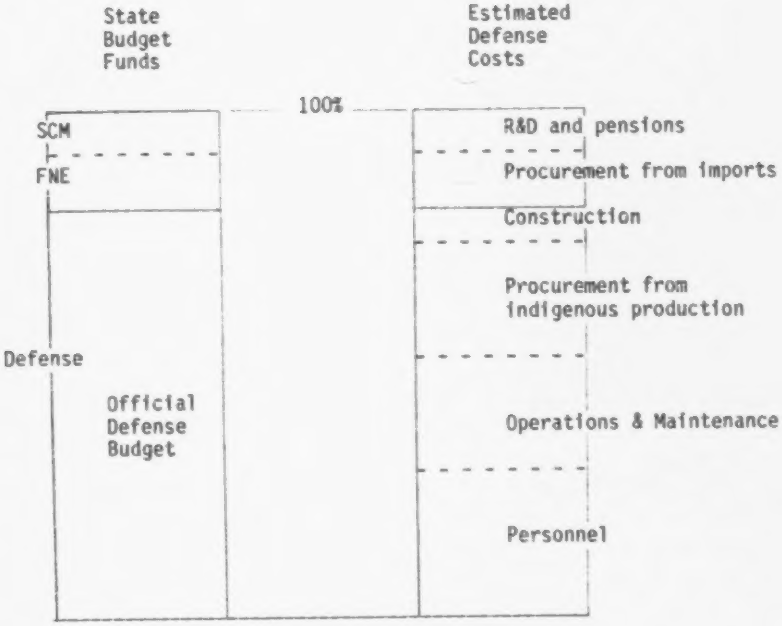
[9] This comparison excludes Bulgaria, which no longer reports its defense budget; and East Germany, which may publish a figure that is more inclusive than the cost estimate. The East German defense budget, which exceeds the estimated total cost by a large amount, may include outlays for categories of military activity that are not considered in this report. One such category pertains to the cost of maintaining the Group of Soviet Forces, Germany (GSFG), estimated at about 400,000 troops. The GSFG-related support costs for infrastructure, troop pay for foreign duty, and supplies undoubtedly are large and may be partly borne by East Germany.

Figure 4

NSWP: Financial Flows to Defense, 1981


State
Budget
Funds
Estimated
Defense
Costs
100%
SCM
FNE
Defense
Official
Defense
Budget
R&D and pensions
Procurement from imports
Construction
Procurement from
indigenous production
Operations & Maintenance
Personnel

NOTE: Based on data (expressed in indigenous currencies and 1981 prices) for Czechoslovakia, Hungary, Poland, and Romania.

The NSWP state budgets generally comprise four major components: Financing the National Economy (FNE); Social-Cultural Measures and Science (SCM); Defense; and Administration. The FNE and SCM shares depicted in the chart merely reflect the size of the corresponding cost categories, and thus are not based on estimated values.

Source: Statistical Yearbooks of the respective countries, for the official defense budgets.

Defense Intelligence Agency, for the estimated defense costs.

While both the official and estimated cost figures are suitable for general comparisons with US military spending, it is likely that the high-level East European decisionmakers review more broadly-defined financial data, to understand the full impact of defense on the economy. NSWP military planners may prepare defense accounts that combine information on the MOD outlays for the armed forces with other data that pertain to non-MOD military-related costs. One of these additional costs—investment in the construction and outfitting of defense enterprises—may be substantial for Czechoslovakia, Poland, and Romania, which all have well-developed industrial bases supporting the military. Considerable costs may accrue also to the stockpiling of the strategic reserves such as fuel and spare parts. The inclusion of these and other categories in the cost estimates would yield better indicators of the NSWP perception of military spending.

### *b. Costs in U.S. dollars*

#### *(1) Utility of cost estimates*

The estimated dollar costs attempt to portray the overall size of the NSWP defense programs in a manner that is meaningful to Western observers. These monetary measures of defense activity are based on the use of the dollar as a common denominator for aggregating the dissimilar physical components of each nation's military effort, an approach that considers both the quantitative and qualitative features of the armed forces. The dollar estimates are expressed in constant 1981 prices to permit trend comparisons of actual changes in the general level of defense activity, not price changes due to inflation.

The dollar estimates, however, have certain limitations. They do not represent actual NSWP defense outlays and, therefore, should not be used to calculate the defense share of the gross national product or to assess the impact of military spending on the economy. These issues are correctly addressed by evaluating defense cost data in indigenous currencies. Further, the estimated dollar costs should not be used to draw inferences regarding relative military capability or increments to this capability. An accurate assessment of the effectiveness of Pact forces must also consider a variety of factors, such as military doctrine, the moral of forces, and logistics.

#### *(2) Method to estimate costs*

The dollar costs are estimated by using a building-block method similar to the one used for calculating the defense costs in indigenous currencies. The physical components identified for the investment programs (procurement and construction) and the operating programs (personnel and O&M) are costed directly in constant US dollars. The annual quantities for 1970–81 are based on estimates of NSWP military equipment acquisitions, force levels, and personnel strengths; the unit prices reflect estimates of the associated US costs and wages. After multiplying each quantity by the appropriate price, the results are aggregated by region, by country, by resource category, and by force.

### *(3) Results*

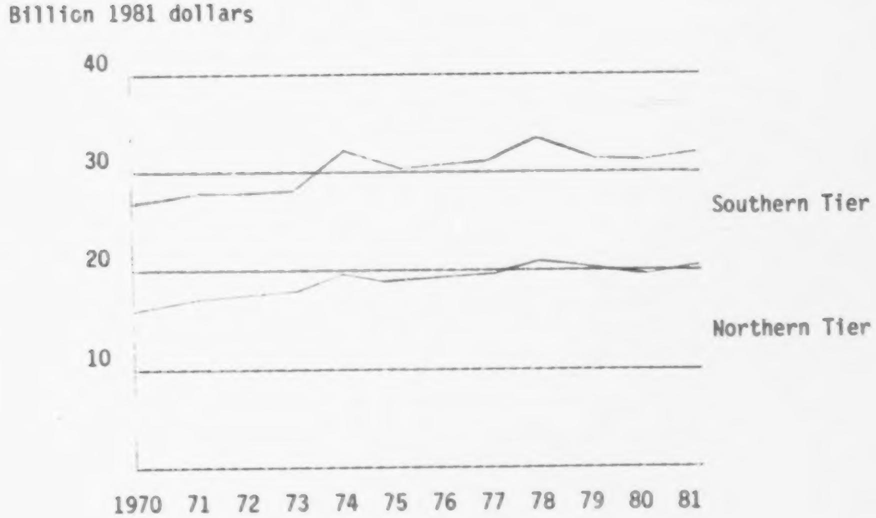
The estimated total dollar cost of NSWP defense programs in 1981 is about $32 billion (in 1981 prices). For the 1970-81 period, the total cost rises at an average annual rate of almost 2 percent, a trend stemming primarily from force modernization activities in each nation.

#### *(a) Dollar costs by region*

The estimated dollar costs of NSWP defense programs are aggregated by region—a northern tier and a southern tier (figure 5—"NSWP: Estimated Dollar Costs of Defense Programs, 1970-81, By Region"). The northern tier comprises Poland, Czechoslovakia, and East Germany; the southern tier comprises Romania, Bulgaria, and Hungary. These geopolitical arrangements are appropriate because they group those countries having defense programs that are similar in size and growth.

Figure 5

NSWP: Estimated Dollar Costs of
Defense Programs, 1970-81
(By Region)



NOTE: Northern Tier - Poland, Czechoslovakia, East Germany
Southern Tier - Romania, Bulgaria, Hungary

Source: Defense Intelligence Agency

A comparison of the total regional costs shows that the collective northern-tier defense programs are substantially larger than those of the southern tier. The estimated cost of the northern-tier programs in 1981 is approximately $20 billion (63 percent of the total cost), and that of the southern tier amounts to about $12 billion. The higher northern-tier cost reflects a level of activity for forces that are quantitatively larger—with about 50 percent more army divisions, 140 percent more aircraft in operational units, 60 percent more naval ships, and 100 percent more surface-to-air missile sites.

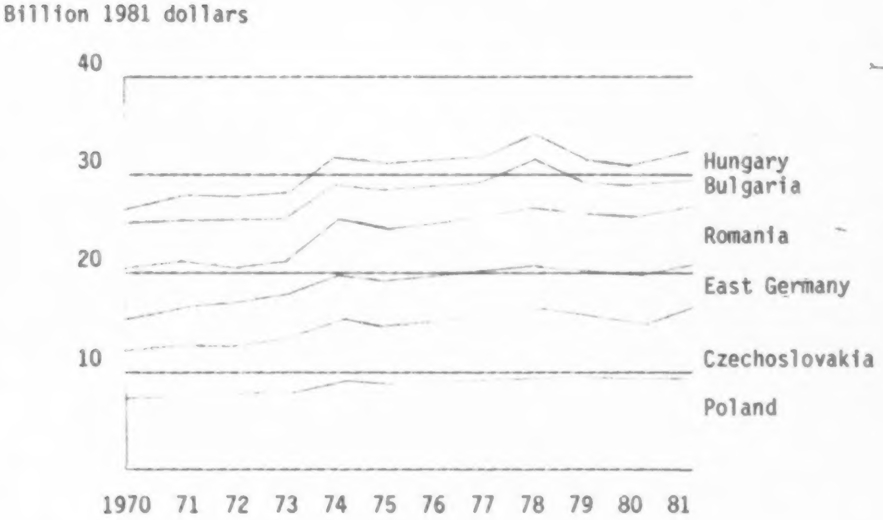
The historical trends for the regional costs reveal that, since 1970, the northern-tier defense programs have expanded at a comparatively quicker pace. During 1970–81, the northern-tier cost rises at an average annual rate of 2.5 percent, while the southern-tier cost advances minimally by less than 1 percent a year. The faster growth for the northern tier is indicative of a greater emphasis on force expansion and modernization.

### *(b) Dollar costs by country*

The dollar costs have been aggregated at the national level to depict the size of each country's total defense program (figure 6—"NSWP: Estimated Dollar Costs of Defense Programs, 1970–81, By Country").

Figure 6

NSWP: Estimated Dollar Costs of
Defense Programs, 1970-81
(By Country)



Source: Defense Intelligence Agency

The total cost for each NSWP nation in 1981 yields a static, yet representative, measure of overall defense activity. In the northern-tier nations, the total cost for Poland is $9 billion; for Czechoslovakia, $6 billion; and for East Germany, $5 billion. In the southern tier, the total cost for Romania is $5 billion; for Bulgaria, $4 billion; and for Hungary, $3 billion. These dollar amounts represent what it would cost in the United States, using prevailing U.S. prices and wages, to procure and man forces of the same size and with the same weapons inventory as those of the NSWP nations, and to operate those forces as they do.

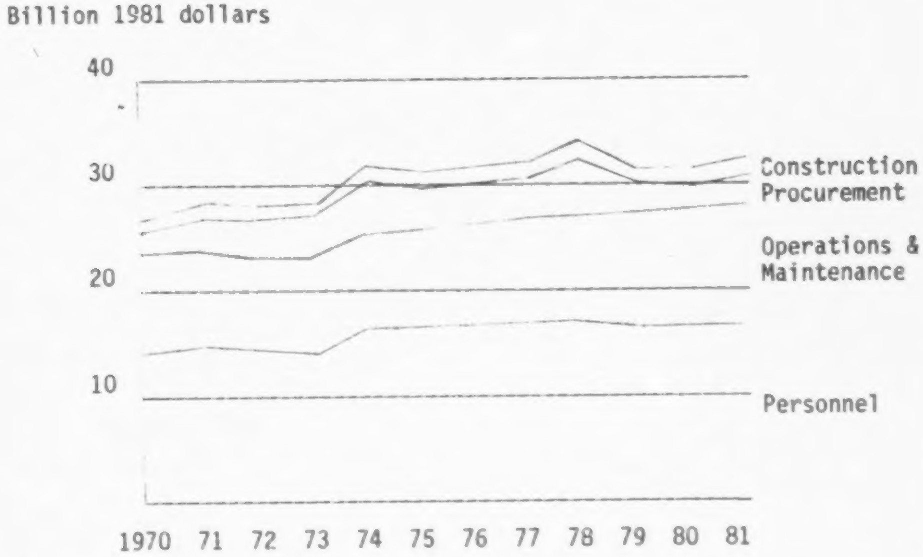
Between 1970 and 1981, the total dollar costs grow at variable rates ranging from substantial in the northern tier to minimal for the southern tier. The cost of East Germany's defense program rises at the fastest pace—4 percent a year; while the costs for Poland and Czechoslovakia each grow by 2 percent annually; and those for Romania, Bulgaria, and Hungary increase by 1 percent a year or less.

### *(c) Dollar costs by resource category*

The dollar costs are aggregated by resource category—investment and operating (figure 7—"NSWP: Estimated Dollar Costs of Defense Programs, 1970-81, By Resource Category"). Investment comprises the procurement of weapon systems and equipment and the construction of military facilities; operating comprises personnel and the operation and maintenance of hardware and military facilities.

Figure 7

NSWP: Estimated Dollar Costs of
Defense Programs, 1970-81
(By Resource Category)



Source: Defense Intelligence Agency

The cost distribution, by resource category, shows that investment is a small, although important, component of the total dollar cost. The NSWP investment total for 1981 amounts to about $4.5 billion, of which $3.0 billion is for procurement and $1.5 billion is for construction. The operating total of $28 billion includes $17 billion for personnel and $11 billion for O&M.

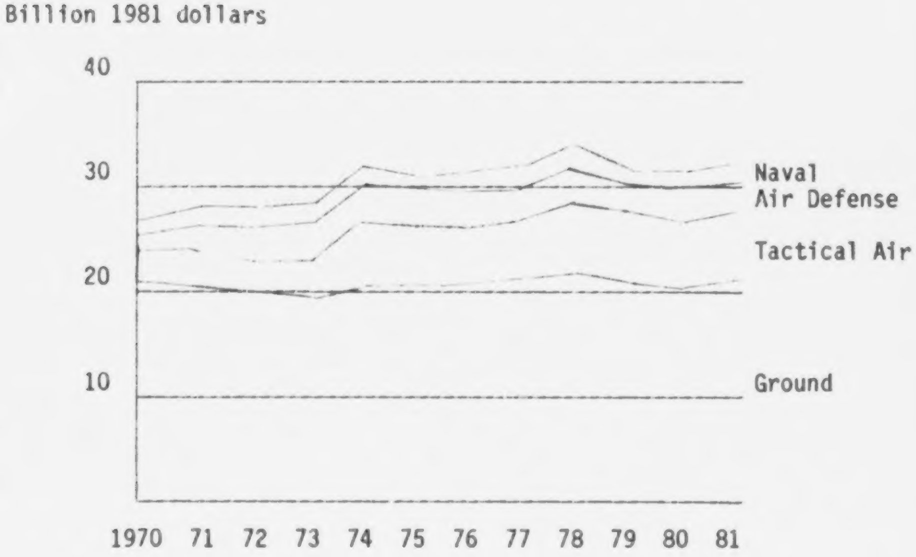
The historical cost trends depict comparatively high growth in NSWP investment programs. For the 1970-81 period, the total investment costs rise by about 3.5 percent a year, primarily the result of major procurement activity during the first half of the 1970s. By comparison, the operating costs increase by only 1.5 percent annually, reflecting similar trends for both personnel and O&M.

### *(d) Dollar costs by force*

The dollar costs for 1970-81 are aggregated by force—ground, tactical air, air defense, and naval (figure 8—"NSWP: Estimated Dollar Costs of Defense Programs, 1970-81, By Force").

Figure 8

NSWP: Estimated Dollar Costs of
Defense Programs, 1970-81
(By Force)



Source: Defense Intelligence Agency

The total force costs indicate that NSWP defense activity is concentrated in the ground component. In 1981, the cost for all NSWP ground forces equals about $22 billion, or 70 percent of the total dollar cost. The respective amounts for the tactical air, air defense, and naval forces are $5 billion, $3 billion, and $2 billion.

The cost trends for the 1970–81 period reveal two basic patterns of growth in the NSWP armed forces. The collective costs for the ground forces and naval forces each rise by 1 percent a year, reflecting gradual force modernization and some increase in personnel strengths. In contrast, the total costs for the tactical air forces and air defense forces increase at annual rates of 6 percent, mostly the result of equipment upgrades during the early 1970s.

# EAST EUROPEAN DEFENSE EXPENDITURES, 1965-1982[1]

By Thad P. Alton, Gregor Lazarcik, Elizabeth M. Bass, and Krzysztof Badach*

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## SUMMARY

This paper continues a tentative series of estimates of East European military expenditures derived within the constraints of officially published defense expenditures. Estimates for 1965-82 are presented in national currencies and U.S. dollars, at current prices, with indications of their estimated shares in GNP for each country. In both domestic and dollar valuations, the approach used essentially relies on officially published defense appropriations.

The domestic currency estimates separate published defense budget totals into personnel costs and other outlays, with some additional estimates for research and development in three countries. Personnel costs are derived using manpower estimates from western sources, and local, East European pay rates and consumption values. Other outlays presumably covering operations and maintenance, and procurements, are derived as residuals within the published budget totals. To the extent that the defense budgets omit a number of military outlays (and there is evidence that this may be to a very substantial extent), outlays for purposes other than personnel are underestimated.

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[1] This study was completed in October 1983. The GNP values here have been revised by later work published in Occasional Paper No. 80 and to appear in No. 85 of the Research Project on National Income in East Central Europe. This paper is a revision and updating of Thad P. Alton, Gregor Lazarcik, Elizabeth M. Bass, and Wassyl Znayenko, "East European Defense Expenditures, 1965-1978," in U.S. Congress, Joint Economic Committee, "East European Economic Assessment," Washington, U.S. Government Printing Office, 1981, pp. 409-433.

The dollar estimates involve direct pricing of manpower at United States pay rates (including subsistence). The nonpersonnel costs, derived as residuals from official budget totals in our domestic currency estimating procedure, are converted into current dollars by ratios derived from our estimates of GNP in domestic currencies and in dollars, for each country and each year covered. Pricing manpower directly in dollars yields a measure of what East European forces personnel would cost in current United States terms. Available conversions for other costs are far from satisfactory. The appropriateness of general, GNP-derived rates is questionable in view of the particular nature of many military procurements. Also, defense ministries in Eastern Europe are exempt from normal price formation rules and may in actuality make their purchases at atypically low prices.

The military effort of the six East European countries covered in this study is substantial: their number of regular active, well-disciplined forces amounts to more than one-half of that of the United States. Even in terms of the narrowly defined official defense budgets, the military expenditures of the six East European countries as a group amount to more than one-fifth of the total defense outlays of the United States in terms of U.S. dollars.

As could be expected, our estimates of defense outlays in terms of shares of GNP are very substantially higher (around 2 or more times) for the East European countries when measured in dollars, assigning U.S. values to personnel, than when measured in East European domestic prices, with nominal pay for conscripts (see Table 1, columns 6 and 7). In both valuations, nonpersonnel costs (operations and maintenance, and procurements, albeit probably not all of them) have risen more rapidly than personnel costs, presumably reflecting modernization of forces, with increasingly sophisticated equipment.

TABLE 1.—GNP, DEFENSE EXPENDITURES, AND IMPLICIT CONVERSION RATES, EAST EUROPEAN COUNTRIES, 1965–82

| Country and year | GNP | | Implicit conversion rate (1$ = unit of EE currency) | Indexes in current dollars (1965 = 100) | | Defense as percentage of GNP in— | |
|---|---|---|---|---|---|---|---|
| | Millions of 1981 dollars | Millions of current dollars | | GNP | Defense | Domestic currencies | Dollars |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Bulgaria: | | | | | | | |
| 1965 | 19,787 | 7,530 | 1.17 | 100.0 | 100.0 | 2.6 | 11.1 |
| 1966 | 21,354 | 8,389 | 1.15 | 111.4 | 103.3 | 2.5 | 10.3 |
| 1967 | 22,502 | 9,104 | 1.14 | 120.9 | 106.6 | 2.4 | 9.8 |
| 1968 | 22,918 | 9,695 | 1.17 | 128.7 | 110.7 | 2.3 | 9.6 |
| 1969 | 24,026 | 10,667 | 1.16 | 141.7 | 119.0 | 2.4 | 9.4 |
| 1970 | 25,363 | 11,871 | 1.15 | 157.6 | 133.8 | 2.4 | 9.4 |
| 1971 | 26,223 | 12,877 | 1.05 | 171.0 | 148.8 | 2.6 | 9.7 |
| 1972 | 27,469 | 14,051 | 1.04 | 186.6 | 165.8 | 2.7 | 9.9 |
| 1973 | 28,558 | 15,440 | 1.02 | 205.0 | 189.5 | 2.7 | 10.3 |
| 1974 | 29,429 | 17,326 | .98 | 230.1 | 225.5 | 2.8 | 10.9 |
| 1975 | 31,863 | 20,503 | .92 | 272.3 | 241.1 | 2.9 | 9.9 |

## TABLE 1.—GNP, DEFENSE EXPENDITURES, AND IMPLICIT CONVERSION RATES, EAST EUROPEAN COUNTRIES, 1965-82—Continued

| Country and year | GNP | | Implicit conversion rate (1$ = unit of EE currency) | Indexes in current dollars (1965 = 100) | | Defense as percentage of GNP in— | |
|---|---|---|---|---|---|---|---|
| | Millions of 1981 dollars (1) | Millions of current dollars (2) | (3) | GNP (4) | Defense (5) | Domestic currencies (6) | Dollars (7) |
| 1976 | 32,819 | 22,209 | .90 | 294.9 | 261.1 | 3.0 | 9.9 |
| 1977 | 32,500 | 23,290 | .88 | 309.3 | 279.2 | 3.2 | 10.1 |
| 1978 | 33,201 | 25,542 | .84 | 339.2 | 284.5 | 3.2 | 9.3 |
| 1979 | 34,476 | 28,815 | .81 | 382.7 | 304.9 | 3.2 | 8.9 |
| 1980 | 33,392 | 30,506 | .89 | 405.1 | 336.5 | 3.2 | 9.3 |
| 1981 | 34,380 | 34,380 | .84 | 456.6 | 375.2 | 3.2 | 9.2 |
| 1982 | 35,336 | 37,451 | .81 | 497.3 | 449.0 | 3.2 | 10.1 |
| Czechoslovakia: | | | | | | | |
| 1965 | 89,993 | 34,284 | 7.09 | 100.0 | 100.0 | 4.0 | 6.3 |
| 1966 | 93,839 | 36,864 | 7.39 | 107.6 | 102.7 | 3.9 | 6.0 |
| 1967 | 97,978 | 39,642 | 8.12 | 115.8 | 109.0 | 3.8 | 5.9 |
| 1968 | 102,387 | 43,311 | 8.36 | 126.5 | 114.1 | 3.7 | 5.7 |
| 1969 | 104,276 | 46,297 | 8.82 | 135.2 | 117.9 | 3.4 | 5.5 |
| 1970 | 106,584 | 49,885 | 8.64 | 145.7 | 117.5 | 3.4 | 5.1 |
| 1971 | 110,124 | 54,076 | 8.29 | 157.9 | 133.3 | 3.4 | 5.3 |
| 1972 | 114,083 | 58,354 | 8.14 | 170.4 | 142.2 | 3.3 | 5.3 |
| 1973 | 117,862 | 63,724 | 7.99 | 186.1 | 156.7 | 3.2 | 5.3 |
| 1974 | 122,090 | 71,880 | 7.74 | 209.9 | 171.6 | 3.0 | 5.2 |
| 1975 | 125,689 | 80,878 | 6.85 | 236.2 | 195.3 | 3.3 | 5.2 |
| 1976 | 127,826 | 86,503 | 6.69 | 252.6 | 200.3 | 3.3 | 5.0 |
| 1977 | 133,230 | 95,476 | 5.93 | 278.8 | 214.8 | 3.3 | 4.9 |
| 1978 | 135,493 | 104,236 | 5.70 | 304.4 | 234.9 | 3.3 | 4.9 |
| 1979 | 136,750 | 114,296 | 5.40 | 333.7 | 249.8 | 3.2 | 4.7 |
| 1980 | 139,640 | 127,569 | 5.09 | 372.5 | 283.4 | 3.3 | 4.8 |
| 1981 | 138,132 | 138,132 | 4.47 | 403.3 | 316.8 | 3.5 | 5.0 |
| 1982 | 138,761 | 147,065 | 4.37 | 429.4 | 353.0 | 3.5 | 5.2 |
| German Democratic Republic: | | | | | | | |
| 1965 | 103,578 | 39,418 | 2.79 | 100.0 | 100.0 | 3.0 | 4.4 |
| 1966 | 106,695 | 41,914 | 2.76 | 106.3 | 104.6 | 2.9 | 4.3 |
| 1967 | 110,114 | 44,552 | 2.77 | 113.0 | 114.9 | 3.1 | 4.5 |
| 1968 | 115,086 | 48,683 | 2.67 | 123.5 | 150.6 | 3.9 | 5.3 |
| 1969 | 117,883 | 52,339 | 2.61 | 132.8 | 164.9 | 4.0 | 5.4 |
| 1970 | 120,913 | 56,591 | 2.55 | 143.6 | 184.0 | 4.2 | 5.6 |
| 1971 | 123,580 | 60,684 | 2.49 | 153.9 | 198.2 | 4.2 | 5.6 |
| 1972 | 127,827 | 65,385 | 2.44 | 165.9 | 212.8 | 4.1 | 5.6 |
| 1973 | 131,764 | 71,240 | 2.35 | 180.7 | 238.4 | 4.1 | 5.8 |
| 1974 | 138,083 | 81,296 | 2.20 | 206.2 | 263.6 | 4.0 | 5.6 |
| 1975 | 143,262 | 92,186 | 2.07 | 233.9 | 300.3 | 3.9 | 5.6 |
| 1976 | 146,127 | 98,888 | 2.00 | 250.9 | 323.4 | 4.0 | 5.6 |
| 1977 | 150,568 | 107,901 | 1.93 | 273.7 | 345.1 | 4.0 | 5.5 |
| 1978 | 153,147 | 117,817 | 1.83 | 298.9 | 379.3 | 4.0 | 5.6 |
| 1979 | 157,445 | 131,593 | 1.70 | 333.8 | 417.4 | 4.1 | 5.5 |
| 1980 | 160,883 | 146,976 | 1.71 | 372.9 | 463.1 | 3.9 | 5.4 |
| 1981 | 164,751 | 164,751 | 1.60 | 418.0 | 527.3 | 4.1 | 5.5 |
| 1982 | 165,611 | 175,522 | 1.55 | 445.3 | 593.4 | 4.2 | 5.8 |
| Hungary: | | | | | | | |
| 1965 | 42,316 | 16,104 | 13.27 | 100.0 | 100.0 | 2.7 | 5.6 |
| 1966 | 44,742 | 17,576 | 13.36 | 109.1 | 95.7 | 2.2 | 4.9 |
| 1967 | 47,279 | 19,129 | 13.49 | 118.8 | 95.8 | 2.1 | 4.5 |
| 1968 | 47,829 | 20,232 | 14.50 | 125.6 | 105.6 | 2.3 | 4.7 |
| 1969 | 49,309 | 21,893 | 15.11 | 135.9 | 116.6 | 2.3 | 4.8 |
| 1970 | 49,138 | 22,998 | 15.39 | 142.8 | 141.2 | 2.8 | 5.6 |
| 1971 | 51,297 | 25,189 | 15.20 | 156.4 | 147.1 | 2.6 | 5.3 |
| 1972 | 52,396 | 26,801 | 15.50 | 166.4 | 152.5 | 2.3 | 5.2 |
| 1973 | 55,145 | 29,815 | 15.43 | 185.1 | 163.1 | 2.1 | 5.0 |
| 1974 | 56,583 | 33,313 | 14.42 | 206.9 | 186.4 | 2.2 | 5.1 |

## TABLE 1.—GNP, DEFENSE EXPENDITURES, AND IMPLICIT CONVERSION RATES, EAST EUROPEAN COUNTRIES, 1965–82—Continued

| Country and year | GNP |  | Implicit conversion rate (1$ = unit of EE currency) | Indexes in current dollars (1965 = 100) |  | Defense as percentage of GNP in— |  |
|---|---|---|---|---|---|---|---|
|  | Millions of 1981 dollars | Millions of current dollars |  | GNP | Defense | Domestic currencies | Dollars |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1975 | 57,809 | 37,199 | 14.10 | 231.0 | 201.0 | 2.3 | 4.9 |
| 1976 | 57,982 | 39,238 | 14.67 | 243.7 | 195.0 | 2.0 | 4.5 |
| 1977 | 61,624 | 44,162 | 14.27 | 274.2 | 201.2 | 2.0 | 4.1 |
| 1978 | 63,127 | 48,565 | 14.07 | 301.6 | 226.8 | 2.2 | 4.2 |
| 1979 | 63,301 | 52,907 | 13.95 | 328.5 | 242.6 | 2.2 | 4.2 |
| 1980 | 63,879 | 58,357 | 13.25 | 362.4 | 288.6 | 2.3 | 4.5 |
| 1981 | 64,110 | 64,110 | 13.11 | 398.1 | 318.5 | 2.3 | 4.5 |
| 1982 | 65,209 | 69,111 | 13.18 | 429.2 | 342.0 | 2.2 | 4.5 |
| Poland: |  |  |  |  |  |  |  |
| 1965 | 112.396 | 42,774 | 16.07 | 100.0 | 100.0 | 3.4 | 6.0 |
| 1966 | 119,524 | 46,954 | 15.71 | 109.8 | 104.2 | 3.5 | 5.7 |
| 1967 | 123,910 | 50,134 | 15.51 | 117.2 | 110.4 | 3.5 | 5.7 |
| 1968 | 131,218 | 55,508 | 15.39 | 129.8 | 123.5 | 3.6 | 5.7 |
| 1969 | 130,094 | 57,760 | 15.48 | 135.0 | 134.9 | 3.8 | 6.0 |
| 1970 | 136,748 | 64,002 | 14.89 | 149.6 | 146.2 | 3.8 | 5.9 |
| 1971 | 146,623 | 71,999 | 15.23 | 168.3 | 165.8 | 3.5 | 5.9 |
| 1972 | 157,304 | 80,463 | 15.40 | 188.1 | 183.1 | 3.3 | 5.8 |
| 1973 | 168,886 | 91,311 | 15.90 | 213.5 | 198.5 | 3.0 | 5.6 |
| 1974 | 178,893 | 105,323 | 16.08 | 246.2 | 218.7 | 2.9 | 5.3 |
| 1975 | 187,326 | 120,540 | 14.68 | 281.8 | 250.0 | 3.0 | 5.3 |
| 1976 | 192,009 | 129,938 | 15.87 | 303.8 | 274.7 | 2.7 | 5.4 |
| 1977 | 195,568 | 140,149 | 15.84 | 327.7 | 296.1 | 2.9 | 5.4 |
| 1978 | 202,499 | 155,785 | 15.36 | 364.2 | 313.7 | 2.7 | 5.2 |
| 1979 | 198,940 | 166,275 | 14.63 | 388.7 | 339.1 | 2.9 | 5.2 |
| 1980 | 194,070 | 177,293 | 14.44 | 414.5 | 369.0 | 2.9 | 5.3 |
| 1981 | 183,579 | 183,579 | 14.72 | 429.2 | 400.8 | 3.1 | 5.6 |
| 1982 | 176,274 | 186,823 | 25.45 | 436.8 | 506.9 | 4.0 | 7.0 |
| Romania: |  |  |  |  |  |  |  |
| 1965 | 44,800 | 17,049 | 12.81 | 100.0 | 100.0 | 2.2 | 8.0 |
| 1966 | 49,940 | 19,618 | 12.25 | 115.1 | 100.2 | 2.1 | 6.9 |
| 1967 | 52,180 | 21,112 | 12.21 | 123.8 | 94.9 | 2.0 | 6.1 |
| 1968 | 53,299 | 22,547 | 12.21 | 132.2 | 102.2 | 2.1 | 6.1 |
| 1969 | 55,718 | 24,738 | 11.66 | 145.1 | 118.4 | 2.2 | 6.5 |
| 1970 | 57,026 | 26,690 | 11.27 | 156.5 | 131.3 | 2.4 | 6.7 |
| 1971 | 65,079 | 31,957 | 10.29 | 187.4 | 134.8 | 2.3 | 5.7 |
| 1972 | 69,244 | 35,419 | 9.98 | 207.7 | 157.4 | 2.2 | 6.0 |
| 1973 | 71,484 | 38,649 | 9.87 | 226.7 | 165.6 | 2.1 | 5.8 |
| 1974 | 75,515 | 44,459 | 9.40 | 260.8 | 188.2 | 2.1 | 5.7 |
| 1975 | 78,874 | 50,754 | 8.87 | 297.7 | 210.3 | 2.2 | 5.6 |
| 1976 | 87,392 | 59,141 | 8.26 | 346.9 | 229.8 | 2.2 | 5.3 |
| 1977 | 89,680 | 64,267 | 8.25 | 376.9 | 239.7 | 2.1 | 5.1 |
| 1978 | 93,860 | 72,207 | 7.91 | 423.5 | 255.6 | 2.1 | 4.8 |
| 1979 | 97,331 | 81,349 | 7.55 | 477.1 | 268.8 | 1.9 | 4.5 |
| 1980 | 95,753 | 87,476 | 7.15 | 513.1 | 278.5 | 1.7 | 4.3 |
| 1981 | 96,305 | 96,305 | 6.78 | 564.9 | 299.2 | 1.6 | 4.2 |
| 1982 | 98,908 | 104,827 | 7.37 | 614.8 | 353.9 | 1.4 | 4.6 |
| Eastern Europe: |  |  |  |  |  |  |  |
| 1965 | 412,871 | 157,123 | .................... | 100.0 | 100.0 | 3.0 | 6.1 |
| 1966 | 436,095 | 171,315 | .................... | 109.0 | 102.5 | 2.8 | 5.7 |
| 1967 | 453,962 | 183,675 | .................... | 116.9 | 107.0 | 2.8 | 5.6 |
| 1968 | 472,737 | 199,976 | .................... | 127.3 | 120.4 | 3.0 | 5.8 |
| 1969 | 481,305 | 213,695 | .................... | 136.0 | 131.0 | 3.0 | 5.9 |
| 1970 | 495,772 | 232,036 | .................... | 147.7 | 142.9 | 3.1 | 5.9 |
| 1971 | 522,925 | 256,782 | .................... | 163.4 | 156.7 | 3.1 | 5.8 |
| 1972 | 548,324 | 280,473 | .................... | 178.5 | 171.2 | 3.0 | 5.8 |
| 1973 | 573,698 | 310,178 | .................... | 197.4 | 187.4 | 2.9 | 5.8 |

TABLE 1.—GNP, DEFENSE EXPENDITURES, AND IMPLICIT CONVERSION RATES, EAST EUROPEAN COUNTRIES, 1965–82—Continued

| Country and year | GNP | | Implicit conversion rate (1$ = unit of EE currency) | Indexes in current dollars (1965 = 100) | | Defense as percentage of GNP in— | |
|---|---|---|---|---|---|---|---|
| | Millions of 1981 dollars | Millions of current dollars | | GNP | Defense | Domestic currencies | Dollars |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1974 | 600,592 | 353,597 | ........ | 225.0 | 209.3 | 2.8 | 5.7 |
| 1975 | 624,823 | 402,060 | ........ | 255.9 | 235.7 | 2.9 | 5.6 |
| 1976 | 644,156 | 435,917 | ........ | 277.4 | 251.6 | 2.9 | 5.5 |
| 1977 | 663,171 | 475,245 | ........ | 302.5 | 268.1 | 2.9 | 5.4 |
| 1978 | 681,328 | 524,152 | ........ | 333.6 | 288.7 | 2.9 | 5.3 |
| 1979 | 688,242 | 575,236 | ........ | 366.1 | 310.9 | 2.9 | 5.2 |
| 1980 | 687,618 | 628,177 | ........ | 399.8 | 343.3 | 2.9 | 5.2 |
| 1981 | 681,259 | 681,259 | ........ | 433.6 | 380.2 | 2.9 | 5.3 |
| 1982 | 680,098 | 720,799 | ........ | 458.7 | 445.3 | 3.1 | 5.9 |

East European military expenditures, although smaller than those of the USSR both in absolute total and in shares of GNP, constitute a significant contribution to the Warsaw Pact and have tended to rise at roughly the same pace as those of the USSR. For the decade 1965–75, this pace exceeded the rate of increase in United States defense expenditures. There was a moderate deceleration of increase rates in 1975–80, then a sharp increase in 1981–82. There is evidence that the East European countries' official defense expenditures substantially understate the cost of their military efforts, and we urge that this caution be kept in mind in international comparisons and other considerations, particularly as regards armament procurements (see Section IV). Economic handbooks published in Eastern Europe state that defense expenditures in national accounting terms enter into both collective consumption and accumulation (investment).

It should be stressed that our findings, perforce, rely on officially published budgets, which may be better reflectors of announced detente policies than of actual military outlays. The highly approximate and incomplete nature of these results underscores the need for continuing work on estimation problems in the military field.

## I. GNP, DEFENSE EXPENDITURES, AND IMPLICIT CONVERSION RATES OF NATIONAL CURRENCIES TO DOLLARS, 1965–82

This report presents for Eastern Europe as a whole and for each country annual estimates of the gross national product in current and constant dollars and total military expenditures in current dollars, conversion rates, and shares of defense in GNP (see Table 1). Given the limitations of time, accessible information, and material resources, our results are approximations which we qualify at various points.

For each country the GNP values in current market prices in the respective national currencies were estimated as follows: Independent estimates of GNP at factor cost were made at our Research Project for Bulgaria for 1968 and 1975, Czechoslovakia for 1967 and 1977, the GDR for 1968 and 1975, Hungary for 1969 and 1976, Poland for 1969 and 1977, and Romania for 1968 and 1977. On the basis of the ratios between GNP and official national income (material product) for these benchmark years, we expanded the official national income series to the GNP concept for all the years covered in this study. It is to be noted that these ratios exhibited a certain degree of stability, comparing the 1967–1969 values with those for 1975–77.

In the present paper we assume that officially given defense expenditure figures include the maintenance of military personnel, military equipment and supplies, and maintenance of equipment and structures. In the GDR, expenditures for internal security are included in published defense expenditure data. On the other hand, indirect military activity, for example, expenditures on military research and development, and a variety of other outlays are not included in the national defense figures. Some adjustments of official figures to conform somewhat more closely with the U.S. definition of military purpose are made in Section II.

The relative importance of military expenditures in different East European countries may be shown in percentages of their total GNP. Comparisons based on such shares will be meaningful only if the basis of valuation of the defense and non-defense (civilian) components of GNPs of various countries is more or less uniform. However, in the East European centrally planned economies, the prices of civilian consumption goods and services, because of the heavy incidence of turnover taxes, most probably are relatively high in relation to prices of military hardware and other procurement items, on which turnover taxes generally are not imposed. Also, very probably, the production of defense items is heavily subsidized through financial transfer at the state budget or lower levels. These pricing policies imply substantial underestimation of the "real" cost of military spending when expressed as a percentage of GNP at market prices in domestic currencies (Table 1, column 6).

The conversion of military expenditures from national currencies into current dollars is a very difficult task, given the lack of information on prices of military items and composition of military procurements in East European countries. Proper conversion, indeed, would require information on the composition of the forces, rates of military pay, the quantity, quality and technical characteristics of the various military items purchased in each year, and the value weights in the national currencies and in dollars. This study offers a simplified approach to the problem based on implicit conversion rates for GNP derived from comparisons of dollar estimates of GNP and domestic currency estimates of GNP, both given in current prices. Further refinements involve estimates of the structure of military expenditures, presented in Section II, with components then converted separately from domestic currencies into current dollars, as described in Section III. All the conversion rates used, it should be said, rest on approximative methods and accordingly should be interpreted with caution.

In this study, the GNP dollar figures were first derived in constant 1981 prices on the basis of GNP in 1981 dollars for the year

1975 extended by our GNP indexes in constant prices.[2] The GNPs in constant 1981 dollars (Table 1, column 1) were then converted into current dollars (Table 1, column 2) by the U.S. GNP implicit price deflator.

Our estimates of defense spending in current dollars (Table 1, column 5 and Table 4, column 1) value East European military personnel's services directly in dollars at United States pay rates for officers and men. Military nonpersonnel and research and development expenditures were converted from domestic currencies into dollars (Table 4, column 3) derived from comparisons of the GNPs in domestic currencies and the corresponding dollar values of the GNPs in current prices.

TABLE 2.—AVERAGE ANNUAL PERCENTAGE RATES OF CHANGE IN GNP AND DEFENSE EXPENDITURES FOR EAST EUROPEAN COUNTRIES, 1965–82

[Calculated from data in constant 1981 and current dollars] [1]

| Country and period | GNP |  | Defense expenditures, current dollars |  |  |
|---|---|---|---|---|---|
|  | Constant 1981 dollars | Current dollars | Total | Personnel costs | Nonpersonnel and R&D costs |
| Bulgaria: |  |  |  |  |  |
| 1965–70 | 4.7 | 9.1 | 5.6 | 5.3 | 7.7 |
| 1970–75 | 4.5 | 11.2 | 13.2 | 12.1 | 18.2 |
| 1975–80 | 1.2 | 8.5 | 6.3 | 4.5 | 12.5 |
| 1980–82 | 2.9 | 10.8 | 15.6 | 17.4 | 10.7 |
| Czechoslovakia: |  |  |  |  |  |
| 1965–70 | 3.5 | 7.9 | 3.7 | 1.6 | 5.8 |
| 1970–75 | 3.4 | 10.1 | 10.2 | 12.2 | 8.3 |
| 1975–80 | 2.2 | 9.6 | 7.8 | 5.9 | 9.4 |
| 1980–82 | −.3 | 7.4 | 11.6 | 13.1 | 10.5 |
| German Democratic Republic: |  |  |  |  |  |
| 1965–70 | 3.2 | 7.6 | 14.3 | 8.4 | 18.7 |
| 1970–75 | 3.5 | 10.2 | 10.3 | 12.7 | 8.8 |
| 1975–80 | 2.4 | 9.8 | 9.0 | 7.2 | 10.1 |
| 1980–82 | 1.5 | 9.3 | 13.2 | 13.3 | 13.2 |
| Hungary: |  |  |  |  |  |
| 1965–70 | 3.0 | 7.4 | 7.1 | 4.3 | 13.0 |
| 1970–75 | 3.4 | 10.0 | 7.5 | 9.0 | 5.0 |
| 1975–80 | 2.3 | 9.7 | 7.7 | 5.0 | 12.0 |
| 1980–82 | 1.0 | 8.8 | 8.9 | 9.4 | 8.2 |
| Poland: |  |  |  |  |  |
| 1965–70 | 3.8 | 8.1 | 8.3 | 4.3 | 12.3 |
| 1970–75 | 6.6 | 13.5 | 10.8 | 15.4 | 6.4 |
| 1975–80 | .9 | 8.3 | 7.8 | 8.0 | 7.7 |
| 1980–82 | −4.7 | 2.7 | 17.5 | 13.9 | 22.6 |
| Romania: |  |  |  |  |  |
| 1965–70 | 4.5 | 9.0 | 5.7 | 3.6 | 13.7 |
| 1970–75 | 6.2 | 13.0 | 10.2 | 9.3 | 11.4 |
| 1975–80 | 3.9 | 11.5 | 5.7 | 6.2 | 4.5 |
| 1980–82 | 1.6 | 9.5 | 12.8 | 18.8 | −3.9 |
| Eastern Europe: |  |  |  |  |  |
| 1965–70 | 3.6 | 8.0 | 7.8 | 4.4 | 12.4 |
| 1970–75 | 4.7 | 11.5 | 10.4 | 12.3 | 8.2 |
| 1975–80 | 2.0 | 9.5 | 7.7 | 6.5 | 9.1 |
| 1980–82 | −.5 | 7.1 | 13.9 | 14.5 | 13.4 |

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[2] For details on method see Research Project on National Income in East Central Europe, Economic Growth in Eastern Europe, 1965, 1970, and 1975–82, Occasional Paper No. 75 (OP-75), New York, 1983. Also cited in this study are earlier papers in this series, OP-59 (1980) and OP-65 (1981).

TABLE 2.—AVERAGE ANNUAL PERCENTAGE RATES OF CHANGE IN GNP AND DEFENSE EXPENDITURES FOR EAST EUROPEAN COUNTRIES, 1965–82—Continued

[Calculated from data in constant 1981 and current dollars] [1]

| Country and period | GNP |  | Defense expenditures, current dollars |  |  |
|---|---|---|---|---|---|
|  | Constant 1981 dollars | Current dollars | Total | Personnel costs | Nonpersonnel and R&D costs |
| U.S.S.R.: |  |  |  |  |  |
| 1965–70 | 4.7 | 9.1 | 8.1 | 5.3 | 11.3 |
| 1970–75 | 4.0 | 10.9 | 10.2 | NA | NA |
| 1975–80 | 1.3 | 8.7 | 9.8 | NA | NA |
| 1980–82 | NA | NA | NA | NA | NA |
| United States: |  |  |  |  |  |
| 1965–70 | 3.1 | 7.5 | 10.7 | 12.0 | 10.1 |
| 1970–75 | 2.7 | 9.5 | 1.7 | 3.7 | .6 |
| 1975–80 | 3.7 | 11.3 | 9.1 | 6.4 | 10.4 |
| 1980–82 | .4 | 8.1 | 17.5 | 16.2 | 18.0 |

[1] Calculated by least squares fit to $L_n = L_o (1 + r)^n$.

The findings in Tables 1 and 2 with reference to other tables may be summarized as follows:

1. The implicit conversion rates between East European domestic currencies and the U.S. dollar decreased in the last 12 to 15 years in most countries because the rate of inflation in the United States was higher than in most East European countries in the 1970s.

2. Military expenditures expressed as percentages of GNP are substantially lower in domestic currencies than in current dollars (compare cols. 6 and 7, Table 1) because of: (a) the very low nominal pay rates in Eastern Europe for enlisted men (a small fraction of their opportunity costs), and (b) price distortions (the uneven incidence of turnover taxes, profit taxes, and subsidies) which result in very low percentage shares for military expenditures in GNP at current market prices (as compared to shares on other bases of valuation, e.g., at opportunity cost, factor cost, or dollar valuations). Thus, these percentage shares of GNP in domestic currencies of centrally planned East European countries are very misleading for comparisons with percentage shares in other countries where such extreme valuation abnormalities do not occur (e.g. Western Europe, U.S.A., Canada).

3. Our rough estimates based on dollar valuations of personnel costs and conversion of other defense outlay components at implicit GNP overall rates indicate that the percentage share of GNP spent on defense in Eastern Europe as a whole is about double the corresponding percentage of GNP calculated in the national currencies (see Table 1).

4. When valued in current dollars (Table 4) the nonpersonnel (operations, maintenance, military procurements) and research and development expenditures, expressed as a percentage of total East European defense outlays, on the whole increased, rising from 39 percent in 1965 to 46 percent in 1982 in an uneven progression. This presumably reflects progress in mechanization and modernization of Eastern Europe's military forces.

5. Based on valuations in current dollars, defense spending for most of the East European countries grew at a somewhat slower

rate than GNP (Table 2). In most of the countries defense spending grew at a slower rate in the 1965–70 period than in the 1970–75 period. The rate of growth slowed down in the 1975–80 period, but was highest in 1980–82. For Eastern Europe as a whole, the average annual percentage rates show a similar fluctuation in these periods: 1965-70—7.8, 1970-75—10.4, 1975-80—7.7, and 1980-82—13.9.

6. In all East European countries the nonpersonnel and R&D dollar costs in 1965–70 grew at higher rates than personnel costs (Table 2). This trend was reversed in some countries during 1970–75, but was resumed in all except Poland and Romania in 1975–80. In 1980–82, both personnel and nonpersonnel costs grew very fast. The higher annual percentage rates of growth of nonpersonnel costs observable in all countries over the 1965–80 period indicate rapid progress in mechanization and modernization of their armed forces.

7. Comparison of Eastern Europe with the USSR shows that the rate of growth of GNP was a little slower in the USSR in 1975–80, while the rate of growth of defense spending was slightly higher. In 1965–70, both rates were slightly higher for the USSR than for Eastern Europe; in 1970–75, both were slightly lower. (Table 2) The East European Warsaw Pact member countries have consistently contributed a lower share of their GNPs to defense than the USSR.[3]

8. Comparison with the U.S., however, shows distinct differences. The average annual rate of growth of defense spending in current dollars for the 1965–80 period has been significantly different in the US than in the USSR or in Eastern Europe. The contrast is greatest for the 1970–75 period, when the U.S. GNP grew at an average annual rate of 9.5 percent, while the military expenditures grew only at 1.7 percent. The respective percentages for the USSR were 10.9 and 10.2, and for Eastern Europe 11.5 and 10.4 (Table 2). In recent years the U.S. is catching up with the USSR and Eastern Europe.

9. U.S. military outlays on nonpersonnel and R&D costs in current dollars barely increased from 1970 to 1975. Since U.S. wholesale prices increased by 58 percent in the same period, the nonpersonnel spending (operations, maintenance, military procurements, and research and development) actually declined in real terms. This is in contrast to the continuous increase of these costs in the USSR and Eastern Europe in the same period.

10. It should be noted that Eastern Europe as a whole currently spends, from defense budgets only, in terms of dollars (see Table 1 and 4), more on defense than any country other than the U.S. and the USSR, or over one-fifth as much as the United States.[4] This is a significant contribution to the total defense expenditures of the Warsaw Pact.

11. It appears that the overall military effort of the Warsaw Pact countries as reflected in defense expenditures has tended to im-

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[3] ACDA, *World Military Expenditures and Arms Transfers, 1968–1977,* p. 61, and *ibid., 1971–1980,* p. 66.

[4] There are tangible indications that the official defense budgets of East European countries cover only a part of their total military spending. See ACDA, op. cit., for U.S., USSR, and other countries' defense expenditures.

prove from 1965 to 1980 while that of the United States and other NATO countries has been relatively deteriorating.

Again, it should be stressed that the conclusions of this study are tentative, necessarily so in view of the need for further research and comparisons of economic potential and related military expenditures. The results shown in Tables 1 and 2 can be improved by detailed studies of the structure of the GNPs in current market prices and in prices with adjustment toward factor cost. Further research on exchange rates based on purchasing power parities of individual defense components is necessary for improving the international comparability of defense spending of various countries. Use of up-to-date reliable purchasing power parity exchange rates for each country could substantially alter the results shown here.

## II. Estimates of the Defense Expenditures of East European Countries by Major Purpose, in Current Domestic Currencies

Estimates in domestic currencies are presented in Table 3. These include a breakdown of direct defense budget expenditures between outlays to support uniformed military personnel and those for operations, maintenance, and procurements as a residual category that could not be further subdivided except on an arbitrary basis. In addition, some rough estimates to reflect presumed research and development of a military nature financed outside of budget defense appropriations are offered for the three countries in which such activities may reasonably be expected to be greater than negligible.

TABLE 3.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES, IN CURRENT DOMESTIC CURRENCIES, 1965–82

[Millions of domestic currencies]

| Country and year | Defense budget expenditures | | | | | Research and development | Total (1) + (6) |
|---|---|---|---|---|---|---|---|
| | Total | Personnel costs | | | Operations, maintenance and procurements | | |
| | | Total | Military pay | Subsistence | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Bulgaria (million leva): | | | | | | | |
| 1965 | 230 | 93 | 47 | 46 | 137 | 0 | 230 |
| 1966 | 240 | 101 | 52 | 49 | 139 | 0 | 240 |
| 1967 | 247 | 115 | 61 | 54 | 132 | 0 | 247 |
| 1968 | 264 | 126 | 64 | 62 | 138 | 0 | 264 |
| 1969 | 302 | 127 | 63 | 64 | 175 | 0 | 302 |
| 1970 | 324 | 126 | 65 | 61 | 198 | 0 | 324 |
| 1971 | 354 | 129 | 66 | 63 | 225 | 0 | 354 |
| 1972 | 391 | 131 | 67 | 64 | 260 | 0 | 391 |
| 1973 | 422 | 147 | 75 | 72 | 275 | 0 | 422 |
| 1974 | 483 | 161 | 81 | 80 | 322 | 0 | 483 |
| 1975 | 548 | 160 | 79 | 81 | 388 | 0 | 548 |
| 1976 | 596 | 171 | 83 | 88 | 425 | 0 | 596 |
| 1977 | 653 | 179 | 85 | 94 | 474 | 0 | 653 |
| 1978 | 690 | 167 | 82 | 85 | 523 | 0 | 690 |
| 1979 | 746 | 175 | 85 | 90 | 571 | 0 | 746 |
| 1980 | 866 | 210 | 94 | 116 | 656 | 0 | 866 |
| 1981 | 926 | 219 | 101 | 118 | 707 | 0 | 926 |
| 1982 | 967 | 236 | 111 | 125 | 731 | 0 | 967 |
| Czechoslovakia (million crowns): | | | | | | | |
| 1965 | 7,896 | 2,539 | 1,038 | 1,501 | 5,357 | 1,722 | 9,618 |

## TABLE 3.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES, IN CURRENT DOMESTIC CURRENCIES, 1965–82—Continued

[Millions of domestic currencies]

| Country and year | Defense budget expenditures | | | | | | Total (1) + (6) |
|---|---|---|---|---|---|---|---|
| | Total | Personnel costs | | | Operations, maintenance and procurements | Research and development | |
| | | Total | Military pay | Subsistence | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1966 | 8,890 | 2,520 | 1,057 | 1,463 | 6,370 | 1,826 | 10,716 |
| 1967 | 10,156 | 2,710 | 1,127 | 1,583 | 7,446 | 2,083 | 12,239 |
| 1968 | 10,945 | 3,014 | 1,233 | 1,781 | 7,931 | 2,332 | 13,277 |
| 1969 | 12,034 | 3,282 | 1,204 | 1,978 | 8,752 | 2,038 | 14,072 |
| 1970 | 12,470 | 2,795 | 1,313 | 1,482 | 9,675 | 2,249 | 14,719 |
| 1971 | 12,972 | 3,014 | 1,373 | 1,641 | 9,958 | 2,384 | 15,356 |
| 1972 | 13,169 | 3,128 | 1,429 | 1,699 | 10,041 | 2,318 | 15,487 |
| 1973 | 13,776 | 3,275 | 1,480 | 1,795 | 10,501 | 2,527 | 16,303 |
| 1974 | 14,043 | 3,530 | 1,568 | 1,962 | 10,513 | 2,729 | 16,772 |
| 1975 | 15,608 | 3,511 | 1,517 | 1,994 | 12,097 | 2,850 | 18,458 |
| 1976 | 15,993 | 3,472 | 1,473 | 1,999 | 12,521 | 2,828 | 18,821 |
| 1977 | 15,651 | 3,530 | 1,493 | 2,037 | 12,121 | 2,995 | 18,646 |
| 1978 | 16,552 | 3,720 | 1,581 | 2,139 | 12,832 | 3,114 | 19,666 |
| 1979 | 16,874 | 3,813 | 1,612 | 2,201 | 13,061 | 3,196 | 20,070 |
| 1980 | 18,069 | 3,942 | 1,663 | 2,279 | 14,127 | 3,200 | 21,269 |
| 1981 | 18,097 | 3,972 | 1,689 | 2,283 | 14,125 | 3,252 | 21,349 |
| 1982 | 18,942 | 4,068 | 1,729 | 2,339 | 14,874 | 3,278 | 22,220 |
| German Democratic Republic (million marks): | | | | | | | |
| 1965 | 3,100 | 629 | 332 | 297 | 2,471 | 155 | 3,255 |
| 1966 | 3,200 | 679 | 358 | 321 | 2,521 | 160 | 3,360 |
| 1967 | 3,600 | 717 | 376 | 341 | 2,883 | 180 | 3,780 |
| 1968 | 4,814 | 812 | 434 | 378 | 4,002 | 241 | 5,055 |
| 1969 | 5,229 | 848 | 452 | 396 | 4,381 | 261 | 5,490 |
| 1970 | 5,712 | 838 | 466 | 372 | 4,874 | 286 | 5,998 |
| 1971 | 6,019 | 837 | 479 | 358 | 5,182 | 301 | 6,320 |
| 1972 | 6,217 | 858 | 495 | 363 | 5,359 | 311 | 6,528 |
| 1973 | 6,571 | 929 | 514 | 415 | 5,642 | 329 | 6,900 |
| 1974 | 6,746 | 957 | 529 | 428 | 5,789 | 337 | 7,083 |
| 1975 | 7,154 | 1,058 | 569 | 489 | 6,096 | 358 | 7,512 |
| 1976 | 7,613 | 1,083 | 587 | 496 | 6,530 | 381 | 7,994 |
| 1977 | 7,868 | 1,128 | 611 | 517 | 6,740 | 393 | 8,261 |
| 1978 | 8,261 | 1,188 | 650 | 538 | 7,073 | 413 | 8,674 |
| 1979 | 8,674 | 1,222 | 668 | 554 | 7,452 | 434 | 9,108 |
| 1980 | 9,403 | 1,280 | 691 | 589 | 8,123 | 470 | 9,873 |
| 1981 | 10,193 | 1,321 | 713 | 608 | 8,872 | 510 | 10,703 |
| 1982 | 10,776 | 1,350 | 730 | 620 | 9,426 | 539 | 11,315 |
| Hungary (million forints): | | | | | | | |
| 1965 | 5,757 | 1,982 | 1,028 | 954 | 3,775 | 0 | 5,757 |
| 1966 | 5,219 | 2,032 | 1,069 | 963 | 3,187 | 0 | 5,219 |
| 1967 | 5,433 | 2,004 | 1,084 | 920 | 3,429 | 0 | 5,433 |
| 1968 | 6,611 | 2,051 | 1,123 | 928 | 4,560 | 0 | 6,611 |
| 1969 | 7,644 | 2,131 | 1,168 | 963 | 5,513 | 0 | 7,644 |
| 1970 | 9,848 | 2,195 | 1,235 | 960 | 7,653 | 0 | 9,848 |
| 1971 | 9,891 | 2,166 | 1,226 | 940 | 7,725 | 0 | 9,891 |
| 1972 | 9,430 | 2,294 | 1,282 | 1,012 | 7,136 | 0 | 9,430 |
| 1973 | 9,488 | 2,386 | 1,332 | 1,054 | 7,102 | 0 | 9,488 |
| 1974 | 10,564 | 2,477 | 1,414 | 1,063 | 8,087 | 0 | 10,564 |
| 1975 | 11,811 | 2,532 | 1,459 | 1,073 | 9,279 | 0 | 11,811 |
| 1976 | 11,671 | 2,571 | 1,515 | 1,056 | 9,100 | 0 | 11,671 |
| 1977 | 12,607 | 2,585 | 1,573 | 1,012 | 10,022 | 0 | 12,607 |
| 1978 | 14,984 | 2,772 | 1,714 | 1,058 | 12,212 | 0 | 14,984 |
| 1979 | 16,200 | 2,983 | 1,830 | 1,153 | 13,217 | 0 | 16,200 |
| 1980 | 17,700 | 3,351 | 1,975 | 1,376 | 14,349 | 0 | 17,700 |

## TABLE 3.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES, IN CURRENT DOMESTIC CURRENCIES, 1965–82—Continued

[Millions of domestic currencies]

| Country and year | Defense budget expenditures | | | | | Research and development | Total (1) + (6) |
|---|---|---|---|---|---|---|---|
| | Total | Personnel costs | | | Operations, maintenance and procurements | | |
| | | Total | Military pay | Subsistence | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1981 | 19,100 | 3,476 | 2,009 | 1,467 | 15,624 | 0 | 19,100 |
| 1982 | 20,200 | 3,511 | 2,074 | 1,437 | 16,689 | 0 | 20,200 |
| Poland (million zlotys): | | | | | | | |
| 1965 | 23,255 | 4,623 | 2,520 | 2,003 | 18,632 | 297 | 23,552 |
| 1966 | 25,213 | 4,412 | 2,513 | 1,899 | 20,801 | 338 | 25,551 |
| 1967 | 26,438 | 4,725 | 2,656 | 2,069 | 21,713 | 412 | 26,850 |
| 1968 | 30,332 | 4,981 | 2,779 | 2,202 | 25,351 | 442 | 30,774 |
| 1969 | 33,519 | 5,150 | 2,830 | 2,320 | 28,369 | 424 | 33,943 |
| 1970 | 35,724 | 4,740 | 2,607 | 2,133 | 30,984 | 450 | 36,174 |
| 1971 | 37,684 | 5,730 | 3,097 | 2,633 | 31,954 | 986 | 38,670 |
| 1972 | 39,490 | 6.223 | 3,379 | 2,844 | 33,267 | 1,274 | 40,764 |
| 1973 | 42,347 | 6,885 | 3,717 | 3,168 | 35,462 | 1,678 | 44,025 |
| 1974 | 46,423 | 7,638 | 4,177 | 3,461 | 38,785 | 1,876 | 48,299 |
| 1975 | 50,223 | 8,993 | 5,019 | 3,974 | 41,230 | 2,070 | 52,293 |
| 1976 | 54,308 | 11,779 | 6,462 | 5,317 | 42,529 | 2,363 | 56,671 |
| 1977 | 61,152 | 12,490 | 6,918 | 5,572 | 48,662 | 2,383 | 63,535 |
| 1978 | 63,314 | 13,203 | 7,277 | 5,926 | 50,111 | 2,398 | 65,712 |
| 1979 | 68,377 | 14,073 | 7,698 | 6,375 | 54,304 | 2,429 | 70,806 |
| 1980 | 71,663 | 15,487 | 8,444 | 7,043 | 56,176 | 2,455 | 74,118 |
| 1981 | 80,840 | 19,334 | 10,391 | 8,943 | 61,506 | 2,445 | 83,285 |
| 1982 | 183,868 | 35,127 | 15,082 | 20,045 | 148,741 | 4,035 | 187,903 |
| Romania (million lei): | | | | | | | |
| 1965 | 4,735 | 1,624 | 808 | 816 | 3,111 | 0 | 4,735 |
| 1966 | 4,927 | 1,686 | 848 | 838 | 3,241 | 0 | 4,927 |
| 1967 | 5,146 | 1,617 | 852 | 765 | 3,529 | 0 | 5,146 |
| 1968 | 5,751 | 1,587 | 799 | 788 | 4,164 | 0 | 5,751 |
| 1969 | 6,319 | 1,804 | 910 | 894 | 4,515 | 0 | 6,319 |
| 1970 | 7,067 | 1,892 | 953 | 939 | 5,175 | 0 | 7,067 |
| 1971 | 7,424 | 1,681 | 847 | 834 | 5,743 | 0 | 7,424 |
| 1972 | 7,710 | 1,874 | 944 | 930 | 5,836 | 0 | 7,710 |
| 1973 | 7,835 | 1,876 | 945 | 931 | 5,959 | 0 | 7,835 |
| 1974 | 8,744 | 2,096 | 1,101 | 995 | 6,648 | 0 | 8,744 |
| 1975 | 9,713 | 2,238 | 1,128 | 1,110 | 7,475 | 0 | 9,713 |
| 1976 | 10,575 | 2,469 | 1,244 | 1,225 | 8,106 | 0 | 10,575 |
| 1977 | 10,963 | 2,623 | 1,322 | 1,301 | 8,340 | 0 | 10,963 |
| 1978 | 11,713 | 2,875 | 1,449 | 1,426 | 8,838 | 0 | 11,713 |
| 1979 | 11,835 | 3,014 | 1,519 | 1,495 | 8,821 | 0 | 11,835 |
| 1980 | 10,394 | 3,155 | 1,590 | 1,565 | 7,239 | 0 | 10,394 |
| 1981 | 10,503 | 3.284 | 1,655 | 1,629 | 7,219 | 0 | 10,503 |
| 1982 | 10,773 | 3,957 | 1,994 | 1,963 | 6,816 | 0 | 10,773 |

A rather strict concept of "military purpose" underlies these estimates. The intention is to reflect current outlays to support, equip, and administer armed forces (army, navy, air, and border guards organized and equipped as army units), plus research and development directly related to military purposes. No attempt has been made to assess industrial investments related to armaments production. Nor has any attempt been made to include here various military related outlays known to be financed outside the defense budgets proper, such as benefits to soldiers' families and paid leave for reservists. Investment expenditures made directly by ministries of defense, however, are implicitly included. Judging by the Polish state budget, which is the only one among the six East European countries to provide this detail explicitly, planned investments by the ministry of defense in recent years account for about 5 percent [5] of the ministry's total budget, including investments. These investments evidently are not in armament production facilities or arms themselves, but rather outlays for officers' housing and social cultural facilities.[6]

The same basic estimation method was followed for all the six countries covered. Working from estimates of regular forces and "paramilitary" border and security troops published by the Institute of Strategic Studies, London, and by ACDA, the pay and subsistence of these forces were calculated with reference to national wage rates and consumption data. Exact procedures varied somewhat with the availability of data for the different countries. The resulting personnel costs were then deducted from the defense budget expenditure totals to obtain the estimates for operations (including costs of civilian personnel and other administrative expenses), maintenance, and procurements (other than supplies for the subsistence of uniformed personnel). The bases for the research and development estimates were budget expenditures on "science and research", of which a portion were deemed "military." Again, varying availability of data necessitated some differences in method.

Inevitably, these estimates are very rough approximations. Many choices underlie them, some involving no small element of arbitrariness. For this set of estimates, we have continued to treat all paramilitary forces (border guards, security troops) as though they were financed out of defense budget appropriations uniformly in all countries. There is, however, increasing evidence that in some cases they are supported by the budgets of other, non-defense, ministries. Our personnel cost estimates may thus include manpower that is not actually paid for out of nominal defense appropriations. To the extent that this is so, it would simply mean that our estimates of nonpersonnel costs, derived as residuals from the official defense budgets, are too low.

The general results for all countries expect Romania show total defense expenditures rising more rapidly than personnel costs, 1965-82 (see Table 3). The rise in personnel costs, it should be noted, is partly attributable to the fact that rising wage levels and rising costs of living are reflected in our estimates of pay and subsistence. The numbers of personnel have not consistently increased in recent years. Increasing costs of operations, maintenance, and procurement per uniformed effective are, of course, a logical concomitant of modernization, the introduction of more sophisticated and more expensive weaponry, communications, and other equipment.

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[5] See Dziennik ustaw, various annual numbers giving the state budget.

[6] See Zolnierz wolnosci, June 24, 1976, p. 3; this article states that over 50 percent of the total investment outlays of the armed forces was for housing.

## III. Dollar Estimates of East European Military Expenditures by Major Purpose

This section will indicate various available approaches for conversions of Warsaw Pact country values into United States dollars and describe the alternative used for the estimates in this report. Among the available means for conversion are two sets of official exchange rates and three sets of Western conversion rates.[7] For each country, the official rates are the "basic" rate that is used as a unit of account in foreign trade statistics and the "non-commercial" or tourist rate applied to travellers' funds and sometimes to other personal transactions. Two sets of Western rates that have been used in the field of military expenditures are, first, those estimated by Benoit and Lubell and subsequently adopted as the basis for dollar estimates published by the Stockholm International Peace Research Institute (SIPRI) and the Institute for Strategic Studies, London (ISS), and, second, those calculated by the authors of the present paper and used for dollar estimates published by the U.S. Arms Control and Disarmament Agency (ACDA) for 1960-79. A complete set of our rates for 1965–1982 was revised upward substantially and appears in this study in Table 1, column 3.

Our rates implicitly given by comparisons of aggregates in national currencies and in dollars are far from ideal. They reflect the roughness of the basic estimates, and relatively recent estimates of purchasing power parities. Some work in this field has been done among the East European countries themselves, but very few results have been published. Joint efforts by the United Nations, the World Bank, and the University of Pennsylvania in the UN International Comparison Project (ICP) have produced studies on purchasing power parity conversion rates for thirty-four countries, including Hungary, Poland, and Romania.[8] For 1970, this study gives an overall Hungarian GDP conversion rate to one U.S. dollar of 13.3 forints in Hungarian weights and 19.4 forints in U.S. weights. For 1975, the ICP multilateral conversion rate is 12.3 and the geometric average of the U.S. and Hungary binary rates is 12.5.[9] Unfortunately, the UN study does not give separate conversion rates for military end items.

In the present study, we note an upward revision of our earlier dollar estimates of military expenditures. These higher dollar estimates reflect the revision of our dollar GNPs for the East European countries (OP-65, Table 14 and OP-75, Table 14B)[10] and a consequent change of the implicit conversion rates of East European domestic currencies into dollars. The present revision takes account of the United Nations International Comparisons Project (ICP) for Hungary, Poland, and Romania for 1975. For these three countries, the 1975 dollar GNP totals were calculated from the ICP per capita estimates in their multilateral SNA concept.[11] For Bulgaria, the 1975 per capita value was assumed to be in the same proportion to that of Romania as estimated in our OP-59, Table 9. For Czechoslovakia and the GDR, 1975 per capita values were assumed to be in the same proportions to that of Hungary, also as estimated for OP-59, Table 9. The 1975 dollars were converted to 1981 dollars by the U.S. GNP deflator.[12] Our country GNP indexes as given in OP-59 through 1975 and for subsequent years in OP-75 were applied to get the dollar GNP series on the basis of which the implicit conversions rates were calculated. These conversion rates were applied to the non-personnel component of military outlays in domestic currencies to obtain the dollar estimates.

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[7] See our paper in the JEC 1981 volume, "East European Economic Assessment," pp. 421-425, for a discussion of these conversion rates.

[8] Irving B. Kravis, Zoltan Kenessey, Alan Heston, and Robert Summers, "A System of International Comparisons of Gross Product and Purchasing Power," Baltimore, Johns Hopkins University Press, 1975, and I.B. Kravis, A. Heston, R. Summers, "International Comparisons of Real Product and Purchasing Power," Baltimore, Johns Hopkins University Press, 1978, pp. 181 and 203.

[9] Irving B. Kravis, Alan Heston, and Robert Summers, "World Product and Income: International Comparisons of Real Gross Product," Baltimore, Johns Hopkins Press, 1982, pp. 178, 260.

[10] Reference for OP-59, OP-65, and OP-75 is found in footnote 2, above.

The estimates of military expenditures offered in this section rest in part on conversion rates implicitly derived from GNP estimates in dollars and in national currencies (for the non-personnel expenditures) and in part on direct estimation of the cost of the services of the officers and enlisted men entirely in terms of U.S. cash pay rates including allowances (Table 4). Our results in current U.S. dollars are presented in Table 4. The calculations are summarized below. We assumed that the percentage of officers in total military personnel was roughly the same as in the United States for 1965-70, or about 12 percent on the average.[13] We use this average for the East European countries for 1965-82. It may be noted that this ostensibly differs from the procedure in Section II where, for calculating the cost of military personnel in domestic currencies, we put the number of officers at about 20 percent of the total military personnel. This larger share was assumed to include lower grade officers.

TABLE 4.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES

[Millions of current U.S. dollars]

| Country and year | Total | Personnel costs | Nonpersonnel costs | Percentage share of total: Personnel costs | Percentage share of total: Nonpersonnel costs |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Bulgaria: | | | | | |
| 1965 | 839 | 721 | 118 | 86.0 | 14.0 |
| 1966 | 866 | 745 | 121 | 86.0 | 14.0 |
| 1967 | 894 | 778 | 116 | 87.1 | 12.9 |
| 1968 | 928 | 810 | 118 | 87.3 | 12.7 |
| 1969 | 998 | 847 | 151 | 84.8 | 15.2 |
| 1970 | 1,122 | 950 | 172 | 84.7 | 15.3 |
| 1971 | 1,248 | 1,034 | 214 | 82.8 | 17.2 |
| 1972 | 1,390 | 1,140 | 250 | 82.0 | 18.0 |
| 1973 | 1,589 | 1,320 | 269 | 83.1 | 16.9 |
| 1974 | 1,891 | 1,563 | 328 | 82.7 | 17.3 |

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[11] Ibid.

[12] Statistical Abstract of the United States, 1982-83, p. 454, and Survey of Current Business, No. 1, 1983, p. 16.

[13] See U.S. Department of Commerce, Statistical Abstract of the United States, 1971, p. 252. In the U.S, the percentage of officers increased to an average of 14 percent for the 1971-77; see ibid., 1978, p. 379.

## TABLE 4.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES—Continued

[Millions of current U.S. dollars]

| Country and year | Total (1) | Personnel costs (2) | Nonpersonnel costs (3) | Percentage share of total: Personnel costs (4) | Percentage share of total: Nonpersonnel costs (5) |
|---|---|---|---|---|---|
| 1975 | 2,022 | 1,599 | 423 | 79.1 | 20.9 |
| 1976 | 2,190 | 1,718 | 472 | 78.4 | 21.6 |
| 1977 | 2,341 | 1,801 | 540 | 76.9 | 23.1 |
| 1978 | 2,386 | 1,767 | 619 | 74.0 | 26.0 |
| 1979 | 2,557 | 1,851 | 706 | 72.4 | 27.6 |
| 1980 | 2,822 | 2,083 | 739 | 73.8 | 26.2 |
| 1981 | 3,146 | 2,307 | 840 | 73.3 | 26.7 |
| 1982 | 3,766 | 2,860 | 906 | 75.9 | 24.1 |
| Czechoslovakia: | | | | | |
| 1965 | 2,163 | 1,165 | 998 | 53.9 | 46.1 |
| 1966 | 2,221 | 1,111 | 1,110 | 50.0 | 50.0 |
| 1967 | 2,359 | 1,185 | 1,174 | 50.2 | 49.8 |
| 1968 | 2,469 | 1,241 | 1,228 | 50.3 | 49.7 |
| 1969 | 2,551 | 1,328 | 1,223 | 52.1 | 47.9 |
| 1970 | 2,543 | 1,162 | 1,381 | 45.7 | 54.3 |
| 1971 | 2,884 | 1,396 | 1,488 | 48.4 | 51.6 |
| 1972 | 3,077 | 1,558 | 1,519 | 50.6 | 49.4 |
| 1973 | 3,389 | 1,759 | 1,630 | 51.9 | 48.1 |
| 1974 | 3,712 | 2,000 | 1,712 | 53.9 | 46.1 |
| 1975 | 4,226 | 2,045 | 2,181 | 48.4 | 51.6 |
| 1976 | 4,333 | 2,038 | 2,296 | 47.0 | 53.0 |
| 1977 | 4,646 | 2,096 | 2,550 | 45.1 | 54.9 |
| 1978 | 5,081 | 2,284 | 2,797 | 44.9 | 55.1 |
| 1979 | 5,404 | 2,396 | 3,008 | 44.3 | 55.7 |
| 1980 | 6,131 | 2,725 | 3,406 | 44.5 | 55.5 |
| 1981 | 6,854 | 2,964 | 3,890 | 43.2 | 56.8 |
| 1982 | 7,637 | 3,480 | 4,157 | 45.6 | 54.4 |
| German Democratic Republic: | | | | | |
| 1965 | 1,727 | 786 | 941 | 45.5 | 54.5 |
| 1966 | 1,806 | 836 | 970 | 46.3 | 53.7 |
| 1967 | 1,985 | 881 | 1,104 | 44.4 | 55.6 |
| 1968 | 2,601 | 1,011 | 1,590 | 38.9 | 61.1 |
| 1969 | 2,849 | 1,072 | 1,777 | 37.6 | 62.4 |
| 1970 | 3,178 | 1,156 | 2,022 | 36.4 | 63.6 |
| 1971 | 3,424 | 1,218 | 2,206 | 35.6 | 64.4 |
| 1972 | 3,676 | 1,352 | 2,324 | 36.8 | 63.2 |
| 1973 | 4,118 | 1,579 | 2,539 | 38.3 | 61.7 |
| 1974 | 4,553 | 1,764 | 2,789 | 38.7 | 61.3 |
| 1975 | 5,186 | 2,073 | 3,113 | 40.0 | 60.0 |
| 1976 | 5,586 | 2,135 | 3,451 | 38.2 | 61.8 |
| 1977 | 5,960 | 2,259 | 3,701 | 37.9 | 62.1 |
| 1978 | 6,551 | 2,456 | 4,095 | 37.5 | 62.5 |
| 1979 | 7,210 | 2,578 | 4,632 | 35.8 | 64.2 |
| 1980 | 7,999 | 2,970 | 5,029 | 37.1 | 62.9 |
| 1981 | 9,107 | 3,243 | 5,864 | 35.6 | 64.4 |
| 1982 | 10,249 | 3,807 | 6,442 | 37.1 | 62.9 |
| Hungary: | | | | | |
| 1965 | 905 | 621 | 284 | 68.6 | 31.4 |
| 1966 | 867 | 628 | 239 | 72.5 | 27.5 |
| 1967 | 867 | 613 | 254 | 70.7 | 29.3 |
| 1968 | 956 | 642 | 314 | 67.1 | 32.9 |
| 1969 | 1,056 | 691 | 365 | 65.5 | 34.5 |
| 1970 | 1,278 | 781 | 497 | 61.1 | 38.9 |
| 1971 | 1,332 | 824 | 508 | 61.9 | 38.1 |
| 1972 | 1,380 | 920 | 460 | 66.6 | 33.4 |
| 1973 | 1,476 | 1,016 | 460 | 68.8 | 31.2 |

# TABLE 4.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES—Continued

[Millions of current U.S. dollars]

| Country and year | Total | Personnel costs | Nonpersonnel costs | Percentage share of total | |
|---|---|---|---|---|---|
| | | | | Personnel costs | Nonpersonnel costs |
| | (1) | (2) | (3) | (4) | (5) |
| 1974 | 1,688 | 1,127 | 561 | 66.8 | 33.2 |
| 1975 | 1,820 | 1,162 | 658 | 63.8 | 36.2 |
| 1976 | 1,765 | 1,145 | 620 | 64.9 | 35.1 |
| 1977 | 1,821 | 1,119 | 702 | 61.5 | 38.5 |
| 1978 | 2,053 | 1,185 | 868 | 57.7 | 42.3 |
| 1979 | 2,197 | 1,249 | 948 | 56.9 | 43.1 |
| 1980 | 2,612 | 1,530 | 1,083 | 58.6 | 41.4 |
| 1981 | 2,883 | 1,692 | 1,192 | 58.7 | 41.3 |
| 1982 | 3,096 | 1,830 | 1,266 | 59.1 | 40.9 |
| Poland: | | | | | |
| 1965 | 2,567 | 1,389 | 1,178 | 54.1 | 45.9 |
| 1966 | 2,674 | 1,328 | 1,346 | 49.7 | 50.3 |
| 1967 | 2,834 | 1,408 | 1,426 | 49.7 | 50.3 |
| 1968 | 3,170 | 1,494 | 1,676 | 47.1 | 52.9 |
| 1969 | 3,463 | 1,603 | 1,860 | 46.3 | 53.7 |
| 1970 | 3,753 | 1,642 | 2,111 | 43.8 | 56.2 |
| 1971 | 4,256 | 2,094 | 2,162 | 49.2 | 50.8 |
| 1972 | 4,700 | 2,457 | 2,243 | 52.3 | 47.7 |
| 1973 | 5,095 | 2,759 | 2,336 | 54.1 | 45.9 |
| 1974 | 5,613 | 3,084 | 2,529 | 54.9 | 45.1 |
| 1975 | 6,417 | 3,467 | 2,950 | 54.0 | 46.0 |
| 1976 | 7,050 | 4,221 | 2,829 | 59.9 | 40.1 |
| 1977 | 7,599 | 4,376 | 3,224 | 57.6 | 42.4 |
| 1978 | 8,051 | 4,632 | 3,419 | 57.5 | 42.5 |
| 1979 | 8,703 | 4,826 | 3,877 | 55.5 | 44.5 |
| 1980 | 9,472 | 5,412 | 4,059 | 57.1 | 42.9 |
| 1981 | 10,287 | 5,942 | 4,345 | 57.8 | 42.2 |
| 1982 | 13,012 | 7,010 | 6,002 | 53.9 | 46.1 |
| Romania: | | | | | |
| 1965 | 1,356 | 1,113 | 243 | 82.1 | 17.9 |
| 1966 | 1,359 | 1,094 | 265 | 80.5 | 19.5 |
| 1967 | 1,286 | 997 | 289 | 77.5 | 22.5 |
| 1968 | 1,385 | 1,044 | 341 | 75.4 | 24.6 |
| 1969 | 1,605 | 1,218 | 387 | 75.9 | 24.1 |
| 1970 | 1,780 | 1,321 | 459 | 74.2 | 25.8 |
| 1971 | 1,827 | 1,269 | 558 | 69.4 | 30.6 |
| 1972 | 2,135 | 1,550 | 585 | 72.6 | 27.4 |
| 1973 | 2,245 | 1,641 | 604 | 73.1 | 26.9 |
| 1974 | 2,551 | 1,844 | 707 | 72.3 | 27.7 |
| 1975 | 2,851 | 2,008 | 843 | 70.4 | 29.6 |
| 1976 | 3,116 | 2,135 | 981 | 68.5 | 31.5 |
| 1977 | 3,250 | 2,239 | 1,011 | 68.9 | 31.1 |
| 1978 | 3,466 | 2,348 | 1,117 | 67.8 | 32.2 |
| 1979 | 3,644 | 2,476 | 1,168 | 67.9 | 32.1 |
| 1980 | 3,776 | 2,764 | 1,012 | 73.2 | 26.8 |
| 1981 | 4,057 | 2,992 | 1,065 | 73.7 | 26.3 |
| 1982 | 4,798 | 3,873 | 925 | 80.7 | 19.3 |
| Eastern Europe: | | | | | |
| 1965 | 9,557 | 5,795 | 3,762 | 60.6 | 39.4 |
| 1966 | 9,793 | 5,742 | 4,051 | 58.6 | 41.4 |
| 1967 | 10,225 | 5,862 | 4,363 | 57.3 | 42.7 |
| 1968 | 11,509 | 6,242 | 5,267 | 54.2 | 45.8 |
| 1969 | 12,522 | 6,759 | 5,763 | 54.0 | 46.0 |
| 1970 | 13,654 | 7,012 | 6,642 | 51.4 | 48.6 |
| 1971 | 14,972 | 7,835 | 7,137 | 52.3 | 47.7 |
| 1972 | 16,358 | 8,977 | 7,381 | 54.9 | 45.1 |

TABLE 4.—ESTIMATES OF DEFENSE EXPENDITURES BY MAJOR PURPOSE, EAST EUROPEAN COUNTRIES—Continued

[Millions of current U.S. dollars]

| Country and year | Total | Personnel costs | Nonpersonnel costs | Percentage share of total | |
|---|---|---|---|---|---|
| | | | | Personnel costs | Nonpersonnel costs |
| | (1) | (2) | (3) | (4) | (5) |
| 1973 | 17,912 | 10,074 | 7,838 | 56.2 | 43.8 |
| 1974 | 20,007 | 11,382 | 8,625 | 56.9 | 43.1 |
| 1975 | 22,522 | 12,354 | 10,167 | 54.9 | 45.1 |
| 1976 | 24,041 | 13,392 | 10,649 | 55.7 | 44.3 |
| 1977 | 25,619 | 13,890 | 11,728 | 54.2 | 45.8 |
| 1978 | 27,588 | 14,671 | 12,916 | 53.2 | 46.8 |
| 1979 | 29,714 | 15,376 | 14,338 | 51.7 | 48.3 |
| 1980 | 32,813 | 17,484 | 15,328 | 53.3 | 46.7 |
| 1981 | 36,334 | 19,139 | 17,195 | 52.7 | 47.3 |
| 1982 | 42,559 | 22,860 | 19,699 | 53.7 | 46.3 |

In our calculations we estimated separately three functional categories of military expenditures: 1) personnel costs, broken into compensation for officers and for enlisted men, separately; 2) costs of operations, maintenance, and procurements; and 3) estimates of military research and development for those countries in which this category was believed to be of some significance (i.e., Czechoslovakia, the GDR, and Poland). It is to be noted that military subsistence (cost of food and clothing) is included in compensation of officers and enlisted men in the dollar valuations in Table 4.

Specifically, the estimates of different categories of outlays in current U.S. dollars were done as follows: The cost of personnel was obtained by attributing to officers and enlisted personnel in all East European countries the corresponding average yearly compensation including subsistence allowance, in current dollars (see Statistical Abstract of the United States, Vols. 1965–83). The resulting values are shown in Table 4, column 2.

Dollar estimates of outlays on operations, maintenance, procurements, and research and development (Table 4, column 3) were obtained by converting our estimates in domestic currencies for East European countries (Table 3, columns 5 and 6) by the GNP implicit average exchange rates between the U.S. dollar and domestic currencies given in Table 1, column 3, for respective countries and years. These GNP exchange rates were derived by comparing GNPs in domestic currencies with the corresponding dollar values of the GNPs in current prices. It should be noted that the estimates of military research and development outlays are very rough and were made only for Czechoslovakia, the GDR, and Poland, on the basis of very scanty information.

## IV. CONCLUSIONS AND PROBLEMS

The preliminary findings of defense expenditures of East European countries in national currencies and in U.S. dollars presented in this contribution are very tentative and very narrowly defined. They are based on the officially published budgets of the respective ministries of defense in these countries. No attempt has been made here to measure the defense effort of the East European countries more comprehensively along the lines of the definitions and coverage applied in the United States and other Western countries. Only a token adjustment in the direction of more comprehensive coverage was made by a small, very roughly estimated allowance from the state budget for science and technology that we assigned to military research and development in Czechoslovakia, the GDR, and Poland. These three countries are known to be developing and producing certain up-to-date armaments for the Warsaw Pact countries. Beyond this small R&D allowance, no attempt has been made to include here various military-related expenditures known to be financed outside the defense budgets proper, and not identified as part of the defense outlays in the official statistics of these countries. More specifically, the omitted items of military expenditures financed partly or fully by ministries and agencies other than the ministry of defense in East European countries include:

1. Certain military units, such as border guards, security troops, construction troops, and transport troops, that may be financed partly or fully from the budgets of the ministries of internal affairs, ministries of security, ministries of construction, ministries of transport, or some agency other than the defense ministry.
2. Paid leaves to reservists while on military exercises, which are as a rule financed by the reservists' civilian employers from their own funds.
3. Severance pay to conscripts for several weeks at the beginning of their military service, financed by their civilian employers.
4. Costs of travel of conscripts and reservists to and from the place of military service, exercises or training, which may be borne by the transport ministry or local governments.
5. Costs of preliminary training, which is heavily stressed in all the East European countries, and may be borne partly or fully by the education ministries or local governments.
6. Costs of the transportation of troops and military equipment and the cost of communications for armed forces, which may be partly borne or subsidized by the ministries of transport and communications.
7. All or part of the costs of civilian employees and supporting personnel in the military establishment, which may be financed from the budgets of agencies of the central administration other than the defense ministry proper.
8. Costs of support to soldiers' families, which may be financed partly or fully from the budgets of the ministries of social welfare or local governments.
9. Costs of pensions and disability pay for military personnel, which in many instances may be borne partly or fully by the ministries of social welfare, local governments, and former civilian employers of the soldiers, rather than by the defense ministry.
10. Certain military investments that may be financed partly or fully by the ministry of construction or other economic ministries or industrial associations.
11. The cost of some of the military armament procurement may be partly or fully absorbed by the appropriate production association or ministry and ultimately settled through transfers at the as-

sociation level or by subsidies from the non-defense part of the state budget.

12. Imports of military end items may be financed partly or fully through the ministry of foreign trade price equalization funds or by other channels of financing and not directly from the budget of the ministry of defense.

There are direct references in official gazettes and collections of laws of East European countries concerning pricing and price regulations that state that purchases of the ministry of defense are not subject to the general price regulations and that the defense ministry can set its procurement prices directly or by a different set of regulations. The implication of this differential pricing procedure is that the prices which the ministry of defense pays may be far below the costs incurred by the production enterprises. Differences between production costs and the prices paid by the military may be covered by subsidies from non-defense agencies in the state budget or by financial transfers as noted in item 11. The value of production and price subsidies channeled from the state budget to production associations and enterprises is large in East European countries. Such subsidies could cover a substantial part of the cost of military procurement, and this would not be shown in the published budget expenditures of defense ministries.

The items indicated above, which are either definitely known to be excluded from the official published defense budgets or which are believed very probably to be so excluded, do not exhaust the possibilities. However, they illustrate a broad range of military-related expenditures that are or may be financed outside of the regular published defense budget. If these expenditures are added together, their sum could be very large. To illustrate the order of magnitude which may be at stake, let us assume that the prices paid by a ministry of defense for all its purchases are about one-third below the cost of production. Since the nonpersonnel costs and subsistence valued in national currencies account for very large shares (some above 90 percent) of the officially given defense budgets of most East European countries (see Table 3), this would require perhaps a 45 percent increase in the present defense budgets to enable the ministries of defense to pay the full cost of their purchases and meet also the present level of military cash pay. It may well be that the ministries of defense purchase many items at even lower prices than our assumed one-third discount.

We are not at present in a position to calculate the order of magnitude of all the items enumerated above that should be included in the defense expenditures of the East European countries in order to make their defense outlays comparable with those of Western countries, and the United States in particular, and we refrain from speculation on the magnitude of such outlays. To provide good estimates of the more important military expenditures not included in the official East European defense budgets would require a substantial and sustained research effort. Such an undertaking would examine in detail the intricacies of fiscal and other financial flows of the economies of Eastern Europe in proper perspective.

In the meantime, the present study provides a general picture of the extent, allocation, and trends of defense expenditures in national currencies and in U.S. dollars based on the narrow definition and incomplete coverage of the official defense budgets of the East European countries. This limited approach provides only a sharply circumscribed impression of the military expenditures of these countries. For 1979, however, we attempted to estimate only the personnel outlays financed outside the defense budget. These partial personnel outlays would increase the official defense budgets from 10.6 percent for Poland to 17.5 percent for Czechoslovakia. No attempt was made to estimate the non-personnel outlays financed outside the defense budgets. These outlays may be very substantial.

The military effort of the six East European countries covered in this study is indeed substantial: their number of regular active, well-disciplined forces amounts to more than one-half of that of the United States. Even in terms of the narrowly defined official defense budgets, the military expenditures of the six East European countries as a group amount to more than one-fifth of the total defense outlays of the United States in terms of U.S. dollars, as estimated above.[14]

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[14] Table 1, above; Statistical Abstract of the United States, 1982-1983, p. 351.

# V. POLITICAL FACTORS AND POLICY IMPLICATIONS

## OVERVIEW

By Angela E. Stent*

Eastern European stability has always been the product of a delicate balance of economic, political and social factors, involving complex domestic and international tradeoffs. However, a unique conjunction of destabilizing elements is challenging this status quo in the 1980's. The combination of economic decline, increasing social unrest and Soviet preoccupation with the USSR's own drawn-out succession process has disrupted an already tenuous consensus in many East European countries. This raises serious questions about how the area will withstand a possible simultaneous succession process in four countries—the German Democratic Republic, Hungary, Czechoslovakia and Bulgaria—all of whom have leaders who are over 70 years of age. The next decade will witness a generational power transition in all of these countries—none of which has developed a regularized succession process—raising questions about whether Eastern Europe can continue to function as before while facing the most serious postwar challenge to the legitimacy and stability of its ruling governments.

In the past, the USSR and the governments of Eastern Europe have used economic incentives and palliatives as a partial substitute for political legitimacy, as Sarah Terry shows in her paper, "the complications of Economic Stringency and Political Succession for Stability in Eastern Europe in the Eighties." Where political support for the governments may be lacking, the USSR has been willing to subsidize Eastern European economies to satisfy consumers in order to cement popular acquiescence to their governments. Indeed, the East European consumer is generally better off than his Soviet counterpart to compensate for the more questionable political legitimacy of his government. The introduction of market-oriented economic reforms under the New Economic Mechanism in Hungary is an example of the relative success of this policy of tradeoffs. Material well-being has been a substitute for political support.

The converse has also been true. Sometimes the USSR has been willing to permit its East European allies to introduce certain domestic political concessions, when economic stringency has threatened social stability. Indeed, Hungary has also benefited from these political incentives, since its population enjoys a greater degree of political freedom than the citizens of most other CMEA nations.

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Poland in the period from August 1980 to December 1981 is an example of how far the USSR was willing to make political compromises—in this case by tolerating the growth of the unprecedented independent Solidarity Labor movement—because this detracted the population's attention away from its deteriorating economic plight.

For the rest of the 1980's, this policy of economic/political tradeoffs will become increasingly difficult. Declining economic performance in all East European countries, as Terry shows, makes it highly unlikely that consumers can continue to be satisfied to the extent that they were previously. Indeed, some East European countries have only succeeded in cutting back on their hard currency debt by introducing policies of domestic economic austerity, forcing consumers to tighten their belts. Romania is the most extreme example of this policy. The economic carrot option is, therefore, less realistic than previously.

Moreover, it is doubtful that the political carrot can remain a viable possibility. The history of labor unrest in Poland, the independent peace movements in the GDR and Czechoslovakia and the persistence of political dissidence make it unlikely that further political concessions can be made in an era when the USSR and its allied governments are already concerned about the stability of their social fabric. In addition, in times of succession, communist leaders tend to be cautious about political experimentation. The prospect of simultaneous successions in the four countries mentioned above also raises the issue of how important individual leaders are for the continued viability of their systems. In particular, will Hungary be able to continue its careful compromise between domestic economic and political liberalization on the one hand, and foreign policy conformity on the other, when Janos Kadar—who has led the country since the Soviet invasion in 1956—is no longer in power?

This situation presents challenges and opportunities both for the USSR and the United States. The Soviets have increasingly pursued a policy of damage limitation in their relations with Eastern Europe since the destalinization moves of Nikita S. Khrushchev. There is little room for imaginative, assertive Soviet policies. The Kremlin's main goal has been to retain whatever control it can over Eastern Europe and not to allow any further erosion of its power there. It is doubtful how long it can continue this traditional mix of policies. But is there anything that the United States can do in this environment?

The Terry paper begins to answer these questions by examining in detail the key sources of stability in Eastern Europe—ideology, traditional nationalism, rising levels of material satisfaction and political institutionalization backed by coercive Soviet power. She shows how important material satisfaction has been as a vehicle to ensure political stability, acting as an acceptable substitute for economic and political sovereignty. For instance, in the GDR, Moscow's key Warsaw Pact ally, the population enjoys a standard of living higher than that in other CMEA nations, in part to compensate for the lack of a consensus on national identity in a divided nation and to diminish the force of comparisons with West German living standards, which are well known to the majority of East Germans who watch West German television every night. The USSR has supported these East European policies by alternating periods of economic coercion with infusions of economic largesse, for instance, the huge subsidies given to Poland in 1980 and 1981.

Terry questions whether this policy can continue. She details the economic difficulties facing all East European countries—declining growth rates, failing rates of investment, large hard currency debts, increasingly high energy prices—and sees little sign that these economic problems can be overcome in the near future. Of the CMEA six, Poland's economy is in the worst condition. Although 1983 may have seen an upturn in GNP growth, overall economic activity is at least 25 percent below the 1978 level, and living standards have fallen by as much as 20 percent. There is no sign that the Jaruzelski regime has come to grips with the economic crisis. Bulgaria, by contrast, has an unusually healthy economy, which continues to enjoy a 4 percent annual growth rate. Moreover, the Bulgarians have introduced rather successful economic reforms. Czechoslovakia's economic performance, however, has been declining, and the Czech economy is in the midst of a major recession. The GDR remains the CMEA nation with the highest standard of living and respectable economic performance rates, but with growing hard currency debt problems and falling labor morale, Hungary's economic reforms have produced strong economic performance, but Hungary's debt situation is also becoming more serious and Kadar has been forced to introduce economic austerity measures. Romania's economy resembles that of Poland in its present economic troubles, and may well be the next CMEA nation to experience a serious economic crisis. Its growing hard currency debt and rising energy shortage have imposed severe strains on the economy and society. All East European economies, therefore, face major challenges. Moreover, political and social stability have become increasingly questionable in many East European nations. The USSR, because of its own economic difficulties, cannot continue to subsidize East European economies to offset some of these strains.

Andropov's policy in Eastern Europe was one of immobilism, and Chernenko's was an equally unimaginative holding action. Terry argues that Brezhnev's policy of combining East-West detente with increasing CMEA integration in the 1970s has failed, and that the USSR has never before had to face the possibility of instability in several East European countries at the same time. Previous episodes of instability—the GDR in 1953, Poland in 1956, Hungary in 1956, Czechoslovakia in 1968 and Poland in 1976 and 1980—have been confined to one country at a time. She suggests two possible options—either the USSR should allow Eastern Europe to cut back its contributions to multilateral organizations such as CMEA or the Warsaw Treaty Organization to reduce economic burdens, or Moscow should permit greater political flexibility to soften the impact of increasing economic stringency.

Another possible scenario would be to promote more economic reform, such as those already in operation in Hungary, to try and reduce further political strains. This may well be less dangerous for Moscow than political experimentation in a time of succession. However, all of these courses entail dilemmas for the Soviet leadership. The current state of intra-German relations is a clear example of the inherent pitfalls of all these tradeoffs. The USSR was initially willing to sanction closer intra-German political ties, despite the deployment of U.S. Pershing missiles in the Federal Republic of Germany, largely because the intra-German relationship brings considerable economic benefits to the GDR and prevents a further deterioration of its economic situation. However, the political impact of these intra-German ties has been destabilizing for the GDR, where a peace movement that criticizes both the U.S. and the USSR has arisen, largely influenced by contacts with the West German peace movement which the USSR encourages. Economic rewards clearly have brought political strains to East Germany. The Soviets ultimately put a brake on the intra-German rapprochement because they would not permit the GDR to have closer political ties with the West than they had.

The Soviets, therefore, are caught in an intricate web of contradictory economic and political pressures in their relations with Eastern Europe. Yet, as the other authors in this section show, it is difficult for the United States to exert any significant influence over the situation. U.S. policy toward Eastern Europe is also beset by economic/political contradictions. One part of U.S. tradition has always encouraged differentiation between Eastern Europe and the USSR. This policy suggests that the U.S. should expand economic ties with Eastern Europe, to lessen its economic—and therefore political—dependence on the USSR, and thereby promote greater independence. Economic realities, however, question the wisdom of this policy. The hard currency debt situation in most East European countries acts as a brake on further U.S. economic interdependence with this region. Thus economic exigencies make it difficult for the U.S. to carry out a policy that might appear to be optimal politically.

Moreover, as Francis Miko shows in his chapter, "U.S. Interests, Issues and Policies in Eastern Europe," U.S. policy toward Eastern Europe has traditionally been rather fragmented, an outcome of domestic lobbies, relations with the USSR and relations with our West European allies. Whereas the USSR has pursued a concerted policy toward Western Europe for many years, the U.S. has never been able to implement such a coherent policy toward Eastern Europe for a variety of reasons that Miko discusses. One major theme of continuity has been the attempt to differentiate between East European countries, depending on how independent from the USSR we perceive them to be. Hungary and Romania, for instance, receive Most-Favored-Nation status, although Romania, as Terry and Miko show, is one of the most repressive East European states domestically. Its independent foreign policy line has earned it special U.S. treatment, although Terry indicates that this independence from Moscow may diminish as Bucharest becomes increasingly dependent on Soviet energy supplies. It is difficult to see how U.S. policy can affect the succession process in Eastern Europe, although America's policy of differentiation has undoubtedly given Hungary and Romania some bargaining leverage with the USSR.

U.S. legislation also restricts the extent to which America can affect economic development in Eastern Europe, irrespective of the economic climate. In her paper "U.S. Legislative Framework for

Commercial Relations with Eastern Europe," Kate S. Tomlinson details the Congressional and Executive input into legislation covering economic ties with CMEA. These range from the granting of MFN status to the control of the transfer of high technology to Eastern Europe, to import restrictions and current debates over the renewal of the Export Administration Act. There are significant restrictions on our economic relations with CMEA nations for both strategic, political and economic reasons. U.S. legislation is unlikely to change as long as the USSR remains our chief antagonist and we have to be concerned about the export of certain technologies to its allies.

Given the economic and political strains in Eastern Europe, what are the possible scenarios for the rest of the decade? From the U.S. and West European point of view, the possible crises in Eastern Europe may usher in a period of instability that could heighten East-West tensions. The U.S., despite its desire to see change in Eastern Europe, is well aware that the spread of unrest in several East European countries could provoke undesirable Soviet reactions. The U.S. could marginally contribute to some greater economic stabilization if it were willing to intensify its economic contacts with Eastern Europe and attach certain conditions to these ties.

Since the continuing stability of its buffer states is its most important foreign policy goal, the USSR is unlikely to encourage a significant loosening of ties between itself and its CMEA allies. However, faced with the combination of economic decline and political uncertainty, Moscow might be willing to permit greater economic devolution if this were perceived to be essential for the maintenance of political cohesion. Although the Soviets do not believe that they can separate economic from political stability, they are aware of the tradeoffs between these two areas. Even if it becomes increasingly difficult to make these tradeoffs, there would appear to be no alternative as long as the USSR wishes to maintain Soviet-type economic and political systems in these countries. Whatever happens, the next few years of simultaneous successions in Eastern Europe—and the increasing economic difficulties of those two nations who are not facing leadership successions, namely Poland and Romania—will present the USSR with unprecedented problems of management for the rest of the decade.

# THE IMPLICATIONS OF ECONOMIC STRINGENCY AND POLITICAL SUCCESSION FOR STABILITY IN EASTERN EUROPE IN THE EIGHTIES*

By Sarah M. Terry**

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## I. INTRODUCTION

The prolonged political and economic crisis in Poland has put into question the belief, widely held in the 1970s by Western analysts and bankers alike, that the countries of Eastern Europe were essentially stable, if undemocratic, political entities (and therefore also good credit risks). Indeed, the absence of political democracy, while cause for frequent criticism of these regimes as repressive and illegitimate, was nonetheless seen as contributing to their stability by enhancing the leaderships' ability to contain and manipulate popular expectations that can and often do lead to social unrest and political unpredictability in more open democratic societies. Moreover, it was assumed that the Soviet Union, as the final arbiter of developments in the region, would not allow prolonged crisis much less economic collapse in one of its Warsaw Pact allies—in effect, that Moscow would provide both an economic and political "umbrella." Thus, despite periodic episodes of unrest, affecting each of the East European countries at least once since Stalin's death in 1953 and involving at times open popular revolt and leadership turnover, the political systems themselves were regarded as basically "stable."

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*For the purposes of this paper, Eastern Europe is understood to encompass the six full members of the Council for Mutual Economic Assistance [CMEA]: Bulgaria, Czechoslovakia, the GDR, Hungary, Poland, and Romania.

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Although none of the other countries has shown the multiple symptoms of malaise that afflict Poland, the coincidence of three trends or events in the 1980s is straining, and will continue to strain, the underpinnings of stability throughout the region: first, faltering economic performance; second, the post-Brezhnev succession in the Soviet Union; and, third, the parallel successions that are almost certain to occur in most of the East European countries by the end of the decade. Faltering economic performance, the most widely discussed source of potential instability, is a far more complex phenomenon than simply a decline in growth rates brought on by deteriorating terms of trade, reduced energy supplies, or the chronic and all too familiar deficiencies of centrally planned economies. The failure of the region's ruling parties to take advantage of the influx of Western credits in the 1970s to modernize their economies and adapt them to the demands of a changing world environment has left them with deep structural problems that will prove even more intractable in the climate of economic and credit stringency they face today. The resulting competition for scarce resources is forcing painful choices on the leaderships and threatening the populations' hard-won material gains of the last decade.

The onset of a prolonged and multi-dimensional succession process will further complicate the handling of these economic issues. The succession already under way in the U.S.S.R. will in all probability be a drawn-out two-stage affair and, if past succession periods are any guide, will have deeply destabilizing effects in the region—interrupting the mechanisms of alliance management and policy guidance by Moscow, thereby tempting one or more of the East European parties to test the limits of Soviet tolerance in search of solutions to their own problems. The fact that parallel successions are likely to occur in at least four of the six East European countries (where the present party leaders are already over 70 years of age) merely increases the potential for such miscalculations. While it would be unwarranted to predict any repetition of the Polish events, at least in the near term, it would be equally rash to deny that this combination of stresses will make for a violatile and unpredictable situation not only within individual countries but in relations among members of the Warsaw Pact as well.

In each respect, Eastern Europe in the 1980s presents a very different picture from that of the preceding decade. During the 1970s, the illusion of long-term stability was fostered in East and West alike by rapid aggregate growth rates and an unprecedented degree of leadership stability. In particular, abundant supplies of cheap Soviet energy and Western credits permitted the emergence of an implied social contract between regime and society whereby the leaderships committed themselves to rising levels of material wellbeing in exchange for the political acquiescence of their populations. This fortuitous set of circumstances will not be repeated in the foreseeable future. On the contrary, as the temporary and largely artificial mechanisms supporting the "growth formula" of the 1970s are replaced by the constraints of the 1980s, a new formula for social and political stability will have to be found—and in a climate of uncertainty generated by protracted leadership change.

Moscow's approach to ensuring social and political stability in the region will also have to change in light of current circumstances. Past successes in alliance management were due largely to factors that are not likely to apply in the near term: first, that crises were confined to a single country at any given time and, second, that the USSR's domestic economy was strong enough to allow the Kremlin to support a troubled East European regime while it put its house back in order. Today, the severity of the problems affecting the region increase the potential for simultaneous crises in two or more countries; at the same time, the Soviets are grappling with their own deep-seated economic problems, while the rising costs of propping up faltering East European economies make the blanket granting of large subsidies a thing of the past.

The apparent failure of the June 1984 CMEA summit to adopt a definitive stance on these pressing issues reflects the difficulty of formulating a viable intra-Bloc strategy that will both ensure the degree of control desired by Moscow and, at the same time, foster improved economic performance. The critical choices were not made: CMEA integration is to be "intensified," but "fruitful commercial and economic relations" with the West will still be pursued; the mechanisms of integration and specialization must be "perfected," but no progress has been made toward economic (as opposed to purely administrative) integration or toward genuine currency convertibility; Moscow is demanding increased imports of foods, consumer goods and high quality industrial machinery from the East Europeans, although Soviet deliveries of energy and other raw materials are not likely to rise.

As the Soviet Union and Eastern Europe attempt to come to grips with the political and economic realities of the 1980s, the United States and its allies should reconsider their posture toward the region and ask themselves whether a period of economic stringency and political succession might offer the West a unique opportunity to influence East bloc policies, either by promoting the internal evolution of these systems or by altering their foreign policy behavior. Or, on the contrary, is American (and Western) leverage over the East European countries minimal regardless of political and economic conditions, and even reduced in a time of extreme uncertainty such as now exists? While this article does not address either of these questions, it does provide the background and analysis for formulating answers and policy options.

## II. The Stringency Factor

In view of the importance attached in the last decade and a half to improved levels of material consumption as the primary underpinning of the implied social contract between rulers and ruled, recent declines in the rates of economic growth on a region-wide scale together with the erosion of other sources of regime legitimacy have particularly serious implications for political stability. Detailed analyses of economic performance in the individual countries may be found in other papers. What is needed here is a brief overview of the situation and identification of the critical choices, both economic and political in nature, facing the East European leaderships at the very least for the remainder of this decade.

### THE "DEFERRED TASKS" OF THE 1970S

According to one Western estimate, made early in the current five-year plan period, the aggregate annual growth rate of the six East European members of CMEA for 1981-85 will be on the order of 1.4 percent, or less than one-fifth the rate achieved in the 1971-75 plan period (7.3 percent) and not quite one-third that of the 1976-80 period (4.0 percent). Even excluding the data for Poland, where national income produced is expected to drop by an average of 3.3 percent over the five years (ranging from a low of −13.0 percent in 1981 to a modest recovery level of +2.0 percent in 1985), growth rates in the remaining countries, including the stronger performers such as Bulgaria and the GDR, will in this view show significant declines from the levels of a decade or so ago.[1]

Three years into the plan period it appears that this sober estimate may prove somewhat too pessimistic. Nonetheless, whatever the outcome of the 1981-85 plans, all of the East European economies without exception face major structural adjustments as the support mechanisms that sustained growth rates in the 1960s and 1970s—cheap and abundant Soviet energy and raw materials, followed by the massive influx of Western credits—have run their course and become the liabilities of the 1980s. In particular, the failure on the part of these countries (with the partial exception of Hungary) to take advantage of credit-financed imports of Western technology in order to adapt their industrial structures and economic mechanisms to the demands of the post-OPEC embargo environment has left them with what might best be called "deferred tasks" of modernization, which will prove far more difficult to solve in today's climate of economic austerity and credit stringency than had they been addressed in the 1970s.

Most commonly recognized is the failure to modernize industrial plant to achieve competitive levels of labor productivity and resource efficiency. Instead, Western credits were used to expand capacity (using mostly older energy-intensive technologies) and to boost consumption levels. Even where advanced technologies were imported, the changes in planning and management mechanisms and incentive structures necessary to achieve greater efficiency were not introduced. Thus, where most industrial economies have reduced their energy requirements under the impact of spiraling prices, the East Europeans have locked themselves into excessive levels of energy consumption and now—short of substantial new investments—face the unhappy choice between ruinous exploitation of their own, generally modest, fuel resources and equally ruinous dependence on high-cost imports (whether from Soviet or world market sources).[2]

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[1] Jan Vaňous, "East European Economic Slowdown," Problems of Communism, vol. 31, no. 4 (July-August 1982), p. 3, table 1. These figures are based on estimates made by Wharton Econometric Forecasting Associates, Washington, D.C., and generally fall short of official targets which have subsequently been reduced in several countries.

[2] Concerning the energy consequences of East European economic development strategies in the 1970s, see John P. Hardt, "Soviet Energy Policy in Eastern Europe," Soviet Policy in Eastern Europe, Sarah Meiklejohn Terry, ed. (New Haven: Yale University Press, 1984) pp. 189-220.

A second major area of deferred or incomplete modernization is agriculture. As the London Economist stated not long ago, the CMEA countries "are now paying the price for the old Stalinist sin of treating agriculture as the milchcow of industry." [3] Years of overcentralization and underinvestment, followed by additional years of inappropriate policies—insufficient adaptation of inputs (machinery, fertilizers, pesticides, etc.) to specific crops, overutilization of the land in the interest of short-term results, persistent discrimination against the private sector, and artificially low prices—have led to declines in growth rates for agricultural output (in some cases depressing output in absolute or per capita terms) and encouraged a further outflow of agricultural labor. In view of the critical importance attached to affordable food supplies as a mainstay of consumer satisfaction, especially in the 1970s, such policies have become counterproductive.

No less serious has been the neglect of essential infrastructure investments—the development and maintenance of rail transport and other distribution networks, housing, health care and social services, and environmental protection, to mention the most obvious—all of which have taken a back seat to "productive" investments. It should be recalled that deficiencies in all these areas contributed to the growing paralysis of the Polish economy after 1978, making the entire economic mechanism vulnerable to ordinarily minor disruptions. (Following the harsh winter of 1978/79, Warsaw wags liked to joke that the prescription for catastrophe in Poland was "half a meter of snow and 30 years of socialism.") [4]

While most of these problem areas represent the chronic and all too familiar bottlenecks of CPEs, it is only in the last few years that attention has begun to be focused on the urgency of environmental issues, especially in the highly industrialized Northern Tier states. The specific forms are familiar enough from the experiences of the industrial West; what is alarming is the magnitude of the damage: wide-spread denuding of forests from acid rain as a result of the unrestrained burning of high-sulphur soft coal; levels of air pollution in major industrial districts that threaten to turn "occupational" diseases into general public health problems; contamination of water supplies from agricultural as well as industrial sources, with equally serious implications for public health, fishing resources and future agricultural production, not to mention recreational activities. Although several of the regimes (notably the Czechoslovak and East German) are beginning to acknowledge the severity of the situation, adoption of vigorous pollution control measures has generally been put off as too costly in light of competing priorities. Yet failure to treat these problems in the near term will merely compound future damage and clean-up costs, in the meantime increasing the danger of a major ecological disaster with debilitating social and economic consequences.[5]

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[3] "Eastern Europe's Food Crisis, the Economist, Dec. 26, 1981.

[4] See, e.g., Józef Kúsmierek, "Things I Have Known," Survey, vol. 25, no. 1 (Winter 1980), pp. 44–49

[5] For reports of environmental issues in the GDR and Czechoslovakia, see Cynthia B. Schultz, "The GDR Announces Measures to Save the Forests" and Frank Pohl, "Environmental Deterioration in Czechoslovakia," Radio Free Europe Research [RFER], RAD Background Report/62

Continued

As they begin to confront these "deferred tasks," the East European leaderships are discovering that the key support mechanisms, both domestic and external, that helped them maintain stability in the past are rapidly becoming worrisome constraints on future stability. In the current climate of resource stringency, for example, efforts to maintain (much less raise) consumption levels compete directly with the urgent modernization and infrastructure needs outlined above. On the other hand, attempts to hold down consumption in favor of essential investments are likely to have further negative repercussions for productivity, at least in the short run. In addition, particular sensitivity attaches to the question of food prices and supplies, where the traditional policy of keeping prices artificially low has bought social peace at the cost of depressing agricultural output and imposing an unacceptable level of subsidies on state budgets.

Nor can expectations of upward mobility continue to play a stabilizing role. On the contrary, signs of pressure in the opposite direction are already evident in several countries due to the persistence of low levels of industrial productivity and chronic shortages of blue-collar workers. No longer able to syphon surplus labor from agriculture (where low productivity also limits mobility) and burdened by bloated administrative bureaucracies at the upper end of the socio-economic scale, these economies can satisfy their inflated need for skilled manual labor only by diverting larger numbers of students away from higher education and preparation for jobs in the intelligentsia and service sector (the typical pattern for an advanced industrial society) into blue-collar vocations. So far, at least three of the East European countries have introduced changes in educational and/or job placement policies that effectively place a cap on opportunities for upward mobility, while similar tendencies are also evident elsewhere. Paralleling developments in the Soviet Union, such changes are generally presented as "improvements" in the quality of primary and secondary education. But the effective thrust is to give basic schooling a distinctly vocational orientation, severely limiting access to higher educational institutions and accentuating recent tendencies toward new patterns of social stratification and inherited inequalities, with obvious negative implications for regime legitimacy.[6]

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(Mar. 24, 1983) and RAD BR/95 (May 6, 1983). Environmental problems in Poland received considerable publicity during the Solidarity period, but have since been eclipsed by the more immediate problems of severe economic recession.

[6] Concerning changes in educational policy in the Soviet Union, see: Sergei Voronitsyn, "The Vague Outline of Andropov's School Reform," Radio Liberty Research [RLR], RL 410 (Nov. 4, 1983); and the New York Times, Jan. 5, 1984. Among the East Europeans, the Czechoslovaks appear to have patterned their policy most closely on the Soviet, by adding a year to secondary education and strongly emphasizing vocational training over general education; see RFER, Czechoslovak Situation Report/8 (May 9, 1983), and Sonia Winter, "School Reforms to Train Better Workers," RAD BR/275 (Dec. 19, 1983). The Romanians have gone further, imposing a 25 percent cut in those admitted to higher education since the fall of 1980, with especially heavy cuts in the arts and humanities; even in the natural sciences, theoretical subjects are being eliminated or downplayed with the shift of some departments to factories; RFER, Romanian Situation Report/5 (Mar. 17, 1983). Such "reforms" have apparently not been introduced so far in the GDR, but here too the growing disparity between career aspirations and job opportunities is serious enough to command the attention of East German sociologists; Leslie Holmes, "Problems of 'Developed Socialism' in the GDR" (Paper presented to the 15th annual meeting of the American Asociation for the Advancement of Slavic Studies, Kansas City, Missouri, Oct. 22-25, 1983), pp. 7-8.

The external economic climate has also turned highly unfavorable. In relations with the West, both the high level of outstanding hard-currency obligations and the reluctance of Western banks and governments to extend new loans complicate efforts to cope with their domestic dilemmas. Where in the heyday of easy credits trade with the West added to net material product that could be used domestically, today the need to repay that debt is forcing the East Europeans to maximize exports at the expense of domestic consumption. At the same time, high debt-service ratios (which eat up hard-currency earnings) and the difficulty of selling their uncompetitive manufactures on world markets have caused them to slash imports, in turn depriving them of technology and other inputs necessary to improve product quality or to begin solving their problems of energy conservation and pollution abatement, for which technology available within CMEA is generally inferior. In the East, the rapid deterioration in Eastern Europe's terms of trade with the Soviet Union from 1975 to 1983, as the latter raised energy and raw material prices to world levels and demanded higher quality manufactures in return, aggravated the drain on resources available for domestic use.[7]

Thus, even a return to the more favorable aggregate growth rates of the 1970s (however unlikely for most of the region), or the cautious return of Western banks to East European markets, might in themselves be insufficient to overcome the downward pressures on consumption or the negative consequences for political stability.[8] Improvements in economic conditions must be meaningful to the population in order to have the desired effect on the social and political climate. A statistical rise in real incomes will have little positive impact if it is not accompanied by a marked improvement in the availability of consumer goods and services of the quality and diversity demanded by Eastern Europe's increasingly sophisticated populations; indeed, in conditions of chronic shortages, it will merely feed social frustrations. Here the combination of competing domestic priorities (in particular, the deferred investments), pressures to export more and better quality products to both West and East, and the curtailment of imports of Western goods and technology will affect not only the near-term availability of goods on domestic markets but also the long-term prospects for a qualitative (and therefore meaningful) improvement of the consumer's plight.

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[7] Vanous, "East European Economic Slowdown." A graphic example of the deterioration of Eastern Europe's terms of trade with the Soviet Union is the fact that by 1981 it took 2,300 Ikarus buses (one of Hungary's top exports) to cover the cost of 1 million tons of Soviet oil in 1981, compared with only 800 in 1974; Magyarorszag, July 31, 1983, cited in RFER, RAD BR/195 (Aug. 11, 1983).

[8] Overall, there was some improvement in Eastern Europe's economic performance in 1983 over 1981–82, with a projected regional growth rate of 3.2-3.5 percent, compared with −1.3 percent in 1981 and 0.1 percent in 1982. Among those improving their performance were Czechoslovakia (2.2 percent in 1983 vs. −0.3 percent in 1982), the GDR (4.4 percent vs. 2.5 percent), Poland (4.0–5.0 percent vs. −5.5 percent) and Romania (3.4 percent vs. 2.6 percent). On the other hand, Bulgaria's performance slipped from 4.3 to 3.0 percent, while Hungary's economy remained flat. The fact that Eastern Europe's recession has apparently bottomed out has revived a cautious interest among Western bankers in the region, but all agree that future lending will be limited and selective. See Amity Shlaes, "U.S. Banks Looking to Lend Again in Financially Sounder East Europe," the Wall Street Journal, Mar. 1, 1984. For additional details, see the country outlooks in section IV below.

## THE REFORM ALTERNATIVE

As the magnitude and complexity of their structural problems became apparent, it is not surprising that talk of economic reform, a dormant if not quite taboo issue for most of the 1970s, began to reemerge as the only course that seemed to offer significant and lasting improvements in economic performance. Signs of the new reformist trend first appeared in 1978, with the publication of a series of authoritative articles by prominent Soviet economists on improving the system of planning and management in which, for the first time in nearly a decade, serious attention was given to the need for greater reliance on economic tools. Together with an unusually laudatory article in the Soviet weekly New Times on Hungary, containing a brief and somewhat ambiguous reference to a "Hungarian model of socialism," these articles seemed to signal the East Europeans that they, too, could resume the economic experimenting left off in the late 1960s or early 1970s.[9]

For the most part, however, actual reform efforts over the last five-to-six years have been exceedingly cautious in nature, focusing almost exclusively on the partial (and generally ineffective) administrative decentralization characteristic of earlier "reforms" in the Soviet Union, rather than on the more comprehensive economic decentralization envisioned by the Czechoslovak and Hungarian proposals of the 1960s.[10] With the introduction of the Soviet "mini-reform" of July 1979, which was merely another attempt to refine centrally controlled performance indicators, most of the East Europeans fell quickly into line. Only the Hungarians, with Moscow's apparent approval (or at least tolerance), have returned to the comprehensive blueprint of the "New Economic Mechanism" laid out in 1968, while the Bulgarians have proceeded with an intermediate type of reform—more consistent in its decentralizing features than the Soviet but less so than the Hungarian. In early 1982, following the declaration of martial law, the Polish regime enacted a package of economic reform measures bearing a strong resemblance to the Hungarian model, but continuing economic crisis has made implementation all but impossible, while stiff bureaucratic resistance casts doubt on the longer term prospects. Otherwise, the remaining countries have followed the Soviet lead, limiting their "reforms" (although the word itself is generally avoided) to tinkering with still centralized controls.[11]

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[9] See N. Fedorenko, et al., "Manage Efficiently: Parameters of Management," Pravda, Mar. 23, 1978 (translated in Current Digest of the Soviet Press [CDSP], vol. 30, no. 12, pp, 6–7); subsequent articles by Fedorenko were excerpted in CDSP, vol. 30, nos. 24, pp. 12–13, and 35, pp. 10–12. Concerning Hungary, see New Times, no. 14 (Apr. 1978), pp. 21–24. Concerning the negative influence of Soviet policy on East European reform prospects following the invasion of Czechoslovakia, see Terry, "Theories of Socialist Development," in Terry, ed., Soviet Policy in Eastern Europe, pp. 239–47.

[10] The distinction between partial administrative and comprehensive economic reforms has been best defined by Morris Bornstein. The intent of the former is: "to 'rationalize' the existing scheme of administering the economy, by transferring to lower levels some of the more detailed decisions regarding the composition of output, on the one hand, and production methods, on the other . . . [but] subject to constraints in the form of centrally set global output assignments and input authorizations. This shift would also reduce the burden of decision making at higher levels, freeing them to concentrate on their non-delegable responsibilities regarding investment, location, living standards, foreign economic policy, etc." By contrast, "economic decentralization" marked a major step in the direction of a "socialist regulated market economy" in that it: "envisioned a greater role for domestic and foreign market forces—and concomitantly a smaller voice for central planning and administrative control—in determining the composition of output, the allocation of resources, and even the distribution of income. . . . The state authorities would still control the 'main directions and proportions' of the economy through macroeconomic policy decisions and instruments (taxes, subsidies, credit) . . . But within this regulatory framework, 'the market,' not 'the plan,' would guide the micro-economic decisions of the enterprises about what to produce and how to produce it." See Morris Bornstein, "Economic Reform in Eastern Europe," in East European Economies Post-Helsinki, A compendium of papers submitted to the Joint Economic Committee, Congress of the United States (Washington, D.C.: GPO, 1977), pp. 109–110.

More radical changes may be in the offing. Among the new wrinkles that the Hungarians have already introduced are moves to increase competition between state-owned enterprises, increased scope for private enterprise in the consumer and service sector, and—perhaps the most novel innovation of all—a provision allowing workers in state-run factories to contract with management to work extra hours at higher rates of pay. Additional reforms still on the drawing boards include the establishment of a commercial banking system, creation of shareholding companies, and increased autonomy for enterprises in the selection of management (with a corresponding loss of party influence over appointments), especially in key export industries. Although none of the other countries has moved as far down the road toward a mixed economy as the Hungarians (admittedly much of that still on paper and subject to reversal), there are small signs of a growing appreciation elsewhere of the potential benefits that private initiative could offer, as a source of supply for hard-pressed consumer markets and as a means of absorbing both excess purchasing power (by offering the opportunity of a genuine return on investment) and excess labor that would be released by rationalization of employment in the state sector.[12]

More intriguing than these mixed (and so far largely meagre) results in the area of economic reform, is the revival of interest in the need for fundamental political change. Not since the heady days of the "Prague Spring" has there been such candid discussion of the relationship between the political and economic systems—in particular, the need to give legitimate political expression to the conflicts of interest that will inevitably arise, even in a socialist society, as a consequence of attempts to adapt the economic system to the more demanding climate of the 1980s. In effect, in conditions of prolonged austerity, at least some elements within the East European elites seem ready to acknowledge the validity of Richard Lowenthal's observations a decade ago that that, since "no political system whatsoever can guarantee continuously successful performance," in the long run "there is no alternative to legitimacy based on institutional procedures." Among the more interesting admissions of this connection is the still secret report of the official commission set up by the Polish party to investigate the causes of that country's recurrent crises. The report reads:

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[11] For details of the 1979 Soviet "reform," see Gertrude E. Schroeder, "Soviet Economic Reform' Decrees: More Steps on the Treadmill," in Soviet Economy in the 1980s: "Problems and Prospects," part 1, selected papers submitted to the Joint Economic Committee Congress of the United States (Washington, DC: GPO, 1983), pp. 65–88. For additional comments on East European reform efforts, see section V below.

[12] For a comprehensive review of current Hungarian reform discussions, see the special issue on "Hungary: The Third Wave of Reforms," Journal of Comparative Economics, vol. 7, no. 3 (September 1983). See also, R.L. Tokes, "Reform or Movement: Issues and Prognosis," paper prepared for a Conference on "Hungary in the 1980s," Columbia University, Oct. 28–29, 1983; RFER, Hungarian Situation Reports/12 & 14 (August 30 and Oct. 17, 1983); John Kifner, "A New Ingredient Spices 'Goulash Communism,' " the New York Times, Nov. 10, 1983; and Amity Shlaes, "Hungary Moves to Liberalize Economy," the Wall Street Journal, December 28, 1983. For an intriguing but isolated discussion of the potential benefits of expanding the scope of private enterprise in Poland, see Zygmunt Szeliga, "Skąd brać pieniądze," Polityka, Feb. 27, 1982.

> In general it is possible to state that every social crisis in conditions of the building of socialism is evidence of the appearance in the governing process of spontaneous phenomena which hinder the realization of the goals of socialism that have become ingrained in the consciousness of society, and especially of the working class. The explosion of social dissatisfaction . . . directs attention in a dramatic way to the threat to expectations concerning the realization of the social goals of socialism.
>
> Social expectations concerning realization of these goals relates above all to two spheres:
> (1) the level and conditions of life,
> (2) the sphere of democracy (ludowtadstwo), that is, the extent of participation of working people in decisions concerning the fate of the nation and state.[13]

In the Hungarian literature, as well, one finds growing concern that "slow economic growth, . . . [which] is the only possibility in a system of centrally planned economies, . . . cannot be the foundation for the maintenance of social stability here and now in Eastern Europe—at least outside the Soviet Union." Thus, Hungarian reformers are actively promoting "socialist pluralism" in various forms—a more active political role for parliament and other representative institutions, changes in the electoral law to mandate contested elections, and somewhat broader prerogatives for labor unions in defending worker rights.[14]

The problem, of course, is that most of these ideas—both the more radical economic proposals and the political reforms—run headlong into vested interests at home and in Moscow. In every attempt at systemic change in Eastern Europe in the past, the line has been drawn at institutionalized restraints on the power of central party and planning agencies to determine the direction of political and economic development. Yet, in the absence of such institutionalized curbs, changes in policy or governing style have invariably proven vulnerable to reversal. In a somewhat different vein, changes in incentive policies designed to increase productivity threaten the job security and egalitarian wage structures that the workers have come to regard as a guaranteed right.

## III. THE SUCCESSION FACTOR

One final ingredient in the stability/instability mix in Eastern Europe remains to be examined, namely the influence of leadership succession. In the past, Soviet succession politics have typically had a destabilizing effect on the region. In addition, we need to be concerned not only with the post-Brezhnev (and now post-Andropov) succession in the Soviet Union, but also with parallel succession struggles that are likely to emerge by the end of the decade in Eastern Europe. Here the most obvious candidates are those countries where the incumbent party leaders are over 70 years of age—i.e., Bulgaria, Czechoslovakia, the GDR, and Hungary—but the severity of the problems facing the remaining two countries, Poland and Romania, places the durability of those leaderships in doubt as well.

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[13] "Przyczyny, przebieg i skutki kryzysów spolecznych w dziejach PRL," Zeszyty Historyczne, no. 65 (1983), p. 142. The report, generally known by the name of commission chairman, then Politburo member Hieronim Kubiak, was commissioned by the 9th Extraordinary of the Polish United Workers' Party (PUWP) in July 1981. By the time the draft was completed, in mid-1982, Poland was under martial law and the report's controversial findings were seen by the regime as too threatening to be made public. After extensive revisions and deletions, it was published in a special issue of the Central Committee's theoretical journal Nowe Drogi in late 1982, but the issue was apparently not publicly available. See also Richard Lowenthal, "The Ruling Party in a Mature Society," in Social Consequences of Modernization in Communist Societies, Mark G. Field, ed. (Baltimore: Johns Hopkins University Press, 1976) pp. 106-107.

[14] See especially reports of the article by Tamás Bauer, "The Second Economic Reform and Property Relations" (Mozgó Világ, November 1982) in Tokes, "Reform or Movement," pp. 17-19; and the interview with Reszo Nyers in Trybuna Ludu (August 1, 1983) in RFER, Hungarian Situation Report/12 (August 30, 1983), pp. 9-11. Concerning specific proposals for enhancing the role of elected representative bodies, see the earlier article by Nyers ("Unity and Pluralism," Magyar Hirlap, January 27, 1983) reported in RFER, Hungarian Situation Report/3 (February 8, 1983); and Alfred Reisch, "Hungary Unveils Draft Electoral Law," RFER, RAD BR/224 (September 24, 1983).

Clearly the prospect of more or less simultaneous successions in all countries of the bloc is unprecedented and, given the other stresses facing these regimes, injects an element of unpredictability into any analysis of the situation. Nonetheless, a brief retrospective look at the experiences of the post-Stalin and post-Khrushchev periods provides a useful backdrop against which to assess the potential impact of both the ongoing succession in Moscow and the parallel changeovers in Eastern Europe on regional stability.

### THE LESSONS OF PAST SUCCESSIONS

The fact that the November 1956 Soviet invasion of Hungary occurred three years and eight months after Stalin's death, and the August 1968 Warsaw Pact invasion of Czechoslovakia three years and ten months after Khrushchev's removal, may represent nothing more than an odd coincidence. The evidence suggests, however, that the political uncertainties—in the form of personal rivalries, bureaucratic maneuverings, and policy shifts—that characterize a change of leadership in the Kremlin increase the probabilities of miscalculation on the part of one or more of the East European parties as to how much autonomy or systemic diversity Moscow will tolerate. It is not simply a question of the Soviet leadership being preoccupied with domestic affairs, but of the dynamics of the succession process itself: the inevitable jockeying for position among competing factions in the absence of an institutionalized mechanism for the transfer of power, the equally inevitable policy shifts as factional alignments change, and the pervasive opaqueness of Soviet political discourse temporarily masking or distorting those shifts. In these circumstances, the mechanisms of consistent policy guidance between Moscow and the regional parties tend to break down, opening the door to contradictory signals from rival factions or sudden reversals in policies affecting Eastern Europe. While only those parties already experiencing domestic dislocations and turmoil are likely to be destabilized, neither the record of past succession periods nor the present situation in Eastern Europe can provide much comfort to Brezhnev's heirs.

The rapid-fire shifts in Soviet policy in the three years following Stalin's death in 1953—the Moscow-initiated "New Course," Malenkov's defeat in the "second industrialization debate" and the simultaneous retreat from the "New Course," followed by the beginnings of de-Stalinization with Khrushchev's secret speech to the 20th Congress of the CPSU and the reconciliation with Tito, both seemingly legitimizing the idea of "separate roads to socialism" and the autonomy of socialist states—had a whipsaw effect on the more vulnerable East European regimes. In Hungary, in particular, Malenkov's removal as Soviet premier in February 1955 combined with Khrushchev's temporary alliance with Kremlin hardliners, left the hapless Nagy, the reform-minded premier installed less than two years earlier at Moscow's insistence, at the none too tender mercies of Rákosi, the ultra-Stalinist party leader who had himself barely escaped forced removal in June 1953. By the time the Kremlin leadership recognized its mistake, removing Rákosi in July 1956, the frustrated aspirations of Nagy's countrymen for a more humane form of socialism had boiled over into unacceptable demands for political and economic democratization. In the end, the combination of the real and immediate threat to the Soviet position in Eastern Europe and the potential repercussions of the Hungarian events on Khrushchev's personal position in the Kremlin made a military solution virtually inevitable.[15]

In the other major crisis of 1956, Polish party leaders were more successful in avoiding the kind of direct Soviet meddling that led to the rollercoaster of hope and despair in Hungary. Nonetheless, encouraged by de-Stalinization in Moscow and under growing domestic pressures, they too pushed for a greater degree of autonomy and liberalization than the Kremlin was willing to countenance. That confrontation ended without the use of military force, but only barely. And it was probably only the stark object lesson administered two weeks later by the brutal suppression of the Hungarian revolt that kept the Poles—and perhaps others—from pressing their demands further.[16]

Although the specifics differ, an analysis of events leading to the invasion of Czechoslovakia twelve years later reveals broad similarities in the impact that the post-Khrushchev succession had on that country. Much as the "New Course" had influenced Nagy and his supporters, the quasi-populist mood of the last years under Khrushchev followed by the reformist signals emanating from Moscow in the first years of what was then known as the Brezhnev-Kosygin era—in particular, the 1965 economic reform usually associated with the name of Premier Aleksei Kosygin—gave rise to exaggerated expectations among Czech reformers concerning Moscow's tolerance for change in Eastern Europe as well as the direction of development in the Soviet Union itself. While it is true that the power struggle in the wake of Khrushchev's removal was more muted than the one following Stalin's death—and that there were no sharp reversals of policy, such as had occurred with the "New Course" and with such devastating effect on Hungary—the initial quiescence of the conservative faction around Brezhnev only served to magnify the illusion that the moderate "reform" faction had emerged, or was about to emerge, victorious. As Zdeněk Mlynář, one of the key figures in the Prague Spring, later recounted a 1967 visit to Moscow:

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[15] See, e.g., François Fejtö, A History of the People's Democracies: Eastern Europe Since Stalin (New York: Praeger, 1971), chapters 1–5; and Ferenc Vali, Rift and Revolt in Hungary (Cambridge, MA: Harvard University Press, 1962).

[16] In addition to the Fejtö study cited in the previous note, see accounts of events in Poland in Zbigniew K. Brzezinski, The Soviet Bloc: Unity and Conflict, rev. ed. (Cambridge, MA: Harvard University Press, 1967), especially chapter 8; and Flora Lewis, A Case History of Hope (Garden City, NY: Doubleday, 1958).

> * * * My Soviet counterparts * * * were of the opinion that although many of our reform conceptions could scarcely be considered practicable in the foreseeable future in the USSR, it would nevertheless be exceptionally important for them if something like them were in fact to take place in Czechoslovakia. They felt that reforms and democratization would become necessary in the Soviet Union as well. * * * the general opinion (particularly in the party apparatus) seemed to be that [Brezhnev] represented in "interim government" * * * Most I came across hoped for the victory of a rational line based on expertise, one that would at the same time continue in the democratization process. * * * Only in very isolated instances did I encounter pessimism about democratization in the Soviet Union. * * *
>
> I returned to Prague convinced that the situation was not unpromising and that we could expect positive developments toward democratization in the Soviet Union as well. Meanwhile, however, it was clear that we had to continue our work with no immediate hope of support from the Soviet theoretical and ideological institutes, * * *.
>
> Those who sympathized with our efforts were more numerous, but for the time being they had neither the power nor the position to make themselves felt. Nonetheless, I thought that by 1970 this situation might change in our favor. As it turned out, this was one of the worst appraisals of any situation I have ever made.[17]

A second point of comparison is the reverse impact that developments in Eastern Europe can have on an internal power struggle in the Soviet Union. Just as the Hungarian crisis, as "Exhibit A" in the hardliners' case against de-Stalinization, became a potential obstacle to the consolidation of Khrushchev's power in 1956, so in 1968 the generally perceived threat to Soviet-style socialism posed by the Prague Spring reforms became a potent weapon in the conservative faction's resistance to less radical reforms in the Soviet Union. To quote Mlynář again: "The Kremlin 'hawks' were able to use the problem of democratization in Czechoslovakia as a key issue in resolving the power conflicts inside Moscow at that time. They were consciously exploiting what they felt was an extremely opportune issue for them." [18] In this way, the Czechoslovak reformers, initially encouraged by similar if more limited tendencies in the USSR, ultimately influenced the Soviet power struggle to their own disadvantage.

The present Kremlin leadership is assuredly aware of this past pattern of misperception and miscalculation. Indeed, inasmuch as Brezhnev's policy toward Eastern Europe throughout the 1970's was aimed in part at averting a repetition of the miscalculations that had led to the Czechoslovak crisis—and with Poland as a blunt and continuing reminder of the potential for instability in the region—his former colleagues and immediate heirs are likely to be highly sensitive to the problem. At the same time, and despite whatever precautions the post-Brezhnev leadership may take, the probability that the "succession factor" will once again play an unsettling role in Eastern Europe—and that any resulting instability there will reverberate back on the outcome of the succession in Moscow—is very high. As we have already seen, the depth and complexity of the social and economic problems facing the East European parties, together with the ineffectiveness of the remedies adopted to date, will put great pressure on these regimes to test the limits of Soviet tolerance in their search for more durable solutions. Equally important will be the unprecedented multi-stage, multi-dimensional character of the ongoing (Soviet) and pending (East European) successions.

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[17] Zdeněk Mlynář, Nightfrost in Prague: The End of Humane Socialism (New York: Karz Publishers, 1980), pp. 86–87. For additional comments on misperceptions of the Soviet political situation among the Czech reformers, see George Urban's interviews with Mlynář and Eduard Goldstücker, in Communist Reformation: Nationalism, Internationalism and Change in the World Communist Movement, G. R. Urban, ed. (New York, St. Martin's Press, 1979), pp. 73–74 and 116–17. It was not only the Czechs or other East Europeans who misjudged the balance among competing Soviet factions in this period. As astute an observer as Michel Tatu, Le Monde's Moscow correspondent from 1957 to 1964, saw the post-Khrushchev political balance in much the same terms as Mlynář and went so far as to describe an evolution of the Soviet system toward "parliamentarianism" as inevitable, although he recognized the possibility of temporary reversals or "accidents" along the way; see his Power in the Kremlin: From Khrushchev to Kosygin (New York: Viking Press), especially pp. 429–93 and 538–39.

[18] Mlynář, Nightfrost in Prague, p. 163.

### THE POST-BREZHNEV/POST-ANDROPOV SUCCESSION IN THE USSR

Well in advance of Brezhnev's death in November 1982, it was generally accepted that the penalty for the remarkable leadership stability of his eighteen-year reign would be a drawn-out two-stage succession. Stage one, it was assumed, would involve the emergence of an interim "caretaker" government made up largely of Brezhnev's aging colleagues and committed essentially to a policy of "Brezhnevism without Brezhnev," but likely to last no more than five years. By contrast, stage two would witness a wholesale generational turnover, affecting not only top Party and governmental posts but reaching down into the second and third layers of the Soviet power structure, and bringing to the fore groups whose political attitudes were largely unknown and untested and whose exposure to the outside world (including Eastern Europe) was minimal.

Initially, the selection of Yuri Andropov as Soviet party leader for the first or caretaker stage seemed to promise something more than "Brezhnevism without Brezhnev" and the prospect of a less wrenching transition to stage two. The fact that he was "only" 68 years of age at the time he assumed the General Secretaryship, together with his reputation not only as a tough and shrewd chief of the KGB but as one of the more pragmatic and efficiency-minded members of the Brezhnev collegium, raised expectations both in the Soviet Union and in Eastern Europe that he would move quickly and decisively to attack the accumulated economic problems of the Brezhnev era and to begin rejuvenating the leadership. Among East European moderates in particular, Andropov's prior associations with the region, especially in the 1960s, were seen as boding well for a better understanding of their problems and a more permissive attitude toward reforms, at least of the economic variety.[19]

Such expectations were by no means entirely unfounded. On the contrary, the first year under the new leadership witnessed a vigorous campaign against corruption and inefficiency at all levels, the replacement of a number of key officials, and a resurgence of reformist thinking reminiscent of the Malenkov and Kosygin phases of the last two successions. Andropov himself repeatedly and sharply criticized the half-measures and foot-dragging characteristic of past reform attempts and hinted at the need for a major overhaul of the economic management system. By the end of 1983, a new inner core of younger associates of the Secretary-General, mostly in their late 50s and early 60s, had begun to take shape in the Politburo and Central Committee Secretariat. Yet at the time of his death in February 1984, Andropov could claim no concrete policy changes, while the selection of Konstantin Chernenko, at age 73, as the new Secretary-General ensures that the succession will now be a three rather than two-stage affair.[20]

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[19] See, e.g., R.W. Apple, Jr., "Some Insights Into Andropov Gleaned From Budapest Role," and John F. Burns, "Andropov's Changes: Early Pace Bogs Down," the New York Times, December 28, 1982, and May 5, 1983; also Allen Kroncher, "Waiting for the Economic Reform," RLR, RL 133 (June 16, 1983).

For the East Europeans as well, the results of Andropov's brief tenure were ambiguous at best. Despite the fact that Soviet planners continued to be admonished to study the experiences of the more innovative East European economies—Bulgaria and the GDR were most often cited as the examples to emulate, although Hungarian agriculture also came in for favorable mention—this interest was not translated into a green light for further systemic reforms. Rather, the emphasis in Moscow's approach to the region was on caution and conformity, the "dovetailing of economic and social decisions" and "joint appraisal of collective experience," which will help "to bring the structures of economic mechanisms closer together." Now Andropov's death, barely 15 months after his appointment, implies a prolongation of the transition period, in which the region's pressing problems will be relegated to a back burner while contending factions and generations in the Kremlin sort themselves out.[21]

## THE EAST EUROPEAN SUCCESSIONS

The Brezhnev legacy of leadership continuity in the Soviet Union is reflected in a similar pattern of longevity or immobility in several of Moscow's East European allies. In 1984 the leaders of four of the six regional parties are over 70 years of age: Todor Zhivkov, Secretary-General of the Bulgarian Communist Party (BCP); Gustáv Husák, Secretary-General of the Czechoslovak party (CPCS); Erich Honecker, Secretary-General of the GDR'S Socialist Unity Party (SED); and János Kádár, First Secretary of the Hungarian Socialist Workers' Party (HSWP). In the two remaining countries, Poland and Romania, party chiefs General Wojciech Jaruzelski and Nikolai Ceauşescu are younger (61 and 66 respectively); but for different reasons these regimes, too, are vulnerable to further, possibly sudden change: in Poland because of continuing political and economic turmoil in the wake of the crushing of Solidarity, as well as the anomalous and still fluid relationship between the party and military; in Romania because of the dismal economic performance and political oppressiveness of the Ceauşescu regime. Thus, whether as a result of natural attrition or other causes, all six East European parties face the possibility, if not the probability, of a substantial turnover in the ranks of leading cadres during the remainder of this decade.[22]

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[20] For a review of Andropov's first year as General Secretary, see Jerry F. Hough, "Andropov's First Year," Problems of Communism, vol. 32, no. 6 (November-December 1983), pp. 49-64.

[21] See, e.g., O. Bogomolov, "Obschchee dostoyanie: obmen opytom sotsialisticheskogo stroitel'stva," Pravda, March 14, 1983; also the interview with Bogomolov on Radio Prague, Apr. 6, 1983, as reported in RFER, Czechoslovak Situation Report/7 (Apr. 19, 1983), and Robert L. Hutchings, "Andropov and Eastern Europe," RFER, RAD BR/26 (Feb. 24, 1984).

The postwar history of political succession in Eastern Europe does not suggest that this should necessarily be an alarming prospect. In contrast to Soviet successions, a change of leaders in one of the regional parties has typically been a quick and relatively neat affair which, far from ushering in a period of intense factional rivalry and policy uncertainty, has generally signaled at least a temporary end to uncertainty. The difference is to be explained not by the existence of some institutionalized mechanism for the orderly transfer of power absent from the Soviet system—as in the USSR, there is none—but by Moscow's overriding interest in stability in the region. Thus Soviet influence over the process of leadership selection and replacement within the bloc acts as a substitute for an internal transfer mechanism and as an external check on the eruption of a full-blown power struggle in one of its client states.

This is not to say that Moscow exercises uniform and decisive control over the appointment of a new leader. Rather, available evidence suggests that, at least in the post-Stalin period, the extent of that control or influence has varied considerably. It was most apparent, for example, in the imposition of Kádár in Hungary in 1956, the 1969 replacement of reform leader Alexander Dubček by Husák in Czechoslovakia, and the forced retirement of Walter Ulbricht in the GDR in 1971. On the other hand, the Soviets seem to have had little or no say in the choice of Ceauşescu as Romania's new party leader in 1965. In the more ambiguous cases, whether or not a new leader has been handpicked by Moscow or merely approved, the Kremlin's seal of approval appears to be essential to his promotion and consolidation of power. Even where Soviet influence is limited and indirect (as in Poland in 1956, 1970 and 1980) or negligible (as in Romania in 1965), fear of more direct interference by Moscow becomes an important factor encouraging a party to close ranks around a new leader.

There is, however, one glaring exception to this general pattern—one set of circumstances in which the Soviet presence ceases to have a stabilizing influence in an East European succession and becomes itself an added element of instability. This occurs when the East European succession coincides with a change of leaders in Moscow and, what is especially important, when there is a close correspondence between the contending factions and issues on each side, as was the case in the Hungarian and Czechoslovak crises. It is precisely the possibility of a recurrence of this set of circumstances—this time perhaps in several countries simultaneously, in an extended period of leadership change in the Soviet Union, and at a time when both the Soviets and the East Europeans face broadly comparable problems—that will make the regional situation unpredictable and potentially volatile. Once again, it is almost inevitable that succession processes will become intertwined, with fundamental change in Eastern Europe both hostage to and a factor in the outcome of a power struggle in the Kremlin.

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[22] See Richard F. Staar, Communist Regimes in Eastern Europe, 4th ed. (Stanford: Hoover Institution Press, 1982), pp. 40-41, 46, 78-78, 106-107, 136, 140-41, 170-71, 199-201; and "East European Leadership List," RFER, Sept. 12, 1983. See also discussion of specific leadership situations in section IV below.

## IV. THE OUTLOOK FOR POLITICAL STABILITY IN EASTERN EUROPE

In a region as diverse as Eastern Europe, the particular mix of factors either contributing to or detracting from political stability will obviously differ markedly from country to country. With so much attention focused in the last several years on Poland, it is useful to begin with an overview of that country's continuing crisis in order both to identify the essential conditions for a restoration of stability there, and to provide a base line for gauging the likelihood of a spread of the "Polish virus" elsewhere.

### POLAND

The immediate causes of the Polish crisis that burst into the headlines in August 1980 (although it actually began several years earlier) are sufficiently familiar that they can be quickly summarized here. The key elements were: first, an excessively ambitious and unbalanced strategy of industrial development, financed largely by Western credits and leading to a growing dependence on imported raw materials and technology; second, the failure to implement economic reforms that would have led to more efficient use of energy and other inputs and to the improvements in product quality necessary to become competitive on world markets; third, the return to a policy of deliberate discrimination against the dominant private agricultural sector in favor of the grossly inefficient state and collective farms, prompting the out-migration of the younger generation from the countryside and discouraging production especially of meat products; fourth, wage increases well beyond what could be justified by increases in productivity—a policy aimed at buying off the Polish working class in the wake of the Baltic Coast strikes of 1970/71 and made possible only by the influx of Western credits, but which led both to repressed inflation (shortages of foods and other consumer goods at fixed state prices) and to a rise in real living costs (with rapid price increases on "free" and black markets); and, finally, widespread corruption among party and government bureaucrats, who diverted resources from the general social fund to private use or to facilities restricted to elites.[23]

With Poland's hard-currency debt approaching the $20 billion mark in the late 1970s, aggravated now by the rising cost of Soviet energy and raw materials under the revised intra-CMEA price formula introduced in 1975, a number of choke-points began to appear in the economy as the regime sought to maximize exports while cutting imports even of essential goods. With shortfalls in energy supply acting as the key bottleneck multiplier, disruptions in transportation, raw materials supply, equipment and spare parts, as well as many consumer items, set off a vicious downward spiral whereby shortages of inputs led to declines in production and product quality, which in turn reduced export capacity, leading to more cuts in imports, increased strains on domestic markets, deterioration of public services, further pressure of living standards and a weakening of labor incentives and discipline. Attempts to stem the tide—for example, by forcing up coal exports (Poland's premier hard-currency earner) or curbing grain imports—led only to longer term structural problems, such as massive damage to power generating equipment (from low-quality or adulterated coal delivered to domestic consumers) or stress slaughtering of breeding stock (for lack of feed grains). In a very real sense, then, the increases in retail meat prices which set off the events of August 1980 were merely the catalyst, but not the root cause of the crisis.

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[23] For reviews of the political and economic policies leading up to the 1980 crisis, see R.T. Davies, "Politico-Economic Dynamics of Eastern Europe: The Polish Case," and Zbigniew M. Fallenbuchl, "The Polish Economy at the Beginning of the 1980's," in East European Economic Assessment (A compendium of papers submitted to the Joint Economic Committee, United States Congress) Part I (Washington, D.C.: GPO, 1981), pp. 15-32 and 33-71.

Clearly Poland is the first East European country to experience such an acute and broad-based economic collapse; as we shall see, however, none of the specific problems afflicting Poland is unique to that country. What is unique is the way in which widespread social discontent, which elsewhere has remained largely unfocused and unorganized, coalesced spontaneously and almost overnight into a nationwide mass organization with a coherent program. To understand the Solidarity phenomenon, we must look at three sets of factors: (1) the cultural/historical heritage; (2) the cumulative experiences of previous postwar crises; and (3) the tactics of the Gierek leadership between 1976 and 1980. In the first category, the proverbial anti-Russianism of the Poles is only the most obvious influence; more important to the spirit that gave rise to Solidarity was the experience of more than a century of partition during which the Poles developed both a capacity for clandestine organization and a sense of social community (spoteczeństwo), with the Catholic Church and the intelligentsia rather than the alien state as the foci of national identity and values. Second, the postwar experiences of the Polish working class are unique in Eastern Europe in that three times prior to August 1980 (in 1956, 1970, and 1976) it forced the communist regime into economic concessions, and in the first two instances into changes in party leadership. At the same time, on each occasion the population saw its gains whittled away because they were not backed up by political guarantees, in particular by institutionalized constraints on the arbitrary powers of the party. Third, the apparent confidence of the Gierek regime in the wake of the June 1976 crisis that it would wear down the opposition through a process of attrition—that a more concerted crackdown might only popularize anti-regime sentiments and would certainly damage Gierek's credibility with the West (a factor also in Soviet calculations)—proved a major misjudgment. As a result of this relatively lenient treatment, the various elements of the opposition were able to establish the basis for the organizational networks that proved critical in August 1980. No small influence on this process was the election of Pope John Paul II in the fall of 1978, an event that not only put Poland in the international spotlight (further inhibiting tough repressive measures) but served as a psychological shot in the arm for the frustrated and demoralized population and greatly enhanced the church's leverage vis-a-vis the regime.[24]

A final unique aspect of the Polish situation was the extraordinary 16-month duration of the reform phase of the crisis. In other East European crises, including previous crises in Poland, the period of open challenge to a regime had always been measured in days or weeks, or at most a few months, before the onset of "normalization." The fact that Solidarity held both the Polish regime and Moscow at bay for nearly a year and a half meant that the nation was exposed to an agonizing reappraisal by the ruling party of its errors and malfeasance, to candid discussions of the need for fundamental political and economic reforms and, for the first time in the lives of most Poles, to the opportunity for meaningful political participation. Never before in a Soviet-type system has there been such a complete breakdown of the ideology into its component and ultimately incompatible parts. The Polish working class did what Marx predicted the proletariat would do—and what Lenin doubted that it could do—it found its class consciousness and rose up against an exploitative, privileged ruling class. The irony, of course, was that this consciousness was both nationalist and religious, and that the ruling class (or "red bourgeoisie" as the Poles sometimes called it) ruled in the name of that secular "opiate of the people," Marxism-Leninism.

Today Poland provides the most graphic validation of Lowenthal's thesis concerning the indispensability of legitimacy based on political processes in the absence of continuous successful performance. Although the country's four-year economic slide bottomed out in 1983, with GNP rising by about four percent over 1982 levels, the overall level of economic activity was still at least 25 percent below peak levels achived in 1978, while living standards may have declined by as much as 20 percent (on top of a drop of at least 25-30 percent between 1980 and 1982). By one account, net production in agriculture (impacted by sharp cutbacks in imports of feed grains and other inputs) has fallen to the level of the mid-1950s. In the meantime, nothing has been done to correct glaring structural problems resulting from decades of distorted development. Basic infrastructure investments continue to be neglected; the material- and energy-intensiveness of Polish industry continues to rise, as resources for essential technological improvements decline. The package of economic reforms passed early in 1982, shortly after the declaration of martial law, remains largely on paper, thwarted by a combination of bureaucratic resistance, retention of central control over allocation of key materials in the face of severe shortages, and reluctance to remove subsidies from unprofitable enterprises.[25]

In light of these intractable economic problems, the prospect that the Polish regime can emulate Kádár's "populist" strategy in Hungary after 1956—a hope that has been entertained in the West as well as in Poland—seems doomed to frustration.[26] Moreover, if the option of using material incentives to ease a tense political situation is not feasible, neither can the regime use political concessions to ease the economic straitjacket in which it has put the population. For the highly politicized Poles, who have been betrayed on four previous occasions by the party's pious promises of regeneration and commitment to the social goals of socialism, nothing short of institutional guarantees of a popular voice in the basic decisions of society can do much to restore the credibility of the system. On the other hand, the regime can do little more than trot out shopworn formuli about the "leading role of the party" and promised improvements in the institutions of "socialist democracy." [27]

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[24] See Andrzej Korbonski, "Soviet Policy Toward Poland," in Terry, ed., Soviet Policy in Eastern Europe, pp. 72–76.

[25] Concering economic developments after August 1980, see Zbigniew M. Fallenbuchl, "Poland's Economic Crisis," Problems of Communism, vol, 31, no. 2 (March-April 1982), pp. 1–21; and "The Polish Economy Since August 1980," Canadian Slavonic Papers, vol. 25, no. 3 (September 1983), pp. 361–79. The 1983 figure is based on estimates by Wharton Econometrics and preliminary plan fulfillment data as reported in Shlaes, "U.S. Banks Looking to Lend Again," but may prove to be too high.

The fact that on several occasions since martial law the regime has successfully imposed onerous price increases without the disturbances that occurred in 1970, 1976 and 1980, says little about the basic stability of the present situation. Party officials regularly bemoan the loss of ideological legitimacy and the depth of social alienation, especially among the younger generation. In addition, organizational weaknesses and factional infighting within the party have left Jaruzelski no alternative but to rely, at least temporarily, on the administrative talents of the military officer corps—a situation that will fuel a political tug-of-war in Poland, with possible repercussions in Polish-Soviet relations as long as it persists.[28] Thus, while the unique combination of circumstances that produced the Solidarity phenomenon in Poland is unlikely to recur elsewhere in the bloc, neither will any of the traditional sources of stability and legitimacy be available to that regime in the foreseeable future.

## BULGARIA

The contrast between Poland and Bulgaria could scarcely be more striking. The smallest of Moscow's East European allies, Bulgaria enjoys a well deserved reputation as the most stable and reliable—and therefore (less deservedly) as the least interesting of the six. A country with close cultural and historical ties to Russia, Bulgaria has experienced no major outbreaks of popular unrest in nearly forty years of communist rule (the abortive military coup attempt in 1965 notwithstanding). Party leader Zhivkov has held his position as secretary-general since 1954, making him the longest surviving party leader in the bloc (only Enver Hoxha of Albania has been in power longer). Of the East European economies, Bulgaria's has long been the most closely integrated with the Soviet and, on a per capita basis, has benefited from a higher level of subsidies.[29] As a result, the economy remains one of the strongest in the region and is expected to grow by a respectable 4 percent annually during the current five-year plan (although economic performance may sometimes be overstated). In addition, the regime has made a concerted effort since the early 1970s to bring about a steady, if still modest, rise in the general standard of living of the population.

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[26] For the most comprehensive presentation of a "Hungarian solution" for Poland, see Wlodzimierz Brus, "Perspektywy 'normalizacji' w Polsce," in ANEKS—kwartalnik polityczny, no. 31 (1983), pp. 37-56.

[27] Concerning earlier recognition even at highest party levels of the need for authentic political representation, see the "Kubiak Report" cited in note 29 above. The dialectical dilemma posed by attempts to reconcile authentic participation with a one-party monopoly rule is reflected in the serialized debate on "political pluralism" in Nowe Drogi, the theoretical monthly of the Central Committee of the PUWP, beginning with the September 1982 issue and running at least through December 1983; see also RFER, Polish Situation Report/4 (Feb. 25, 1984) concerning the extension of parliament's term and apparent dissatisfaction with the new electoral law.

[28] Victoria Pope, "In Poland, A Divided Communist Party Debates How to Make Its Ideology Work," Wall Street Journal, Feb. 1, 1984; and J.B. de Weydenthal, "Poland in 1983," RFER, RAD BR/295 (Dec. 31, 1983), and Polish Situation Report/5 (March 6, 1984).

On the other hand, the mere fact of Zhivkov's long tenure and the high degree of dependence on the Soviet Union suggest possible sources of tension and instability for the future. The Bulgarians have been the beneficiaries of Soviet largesse not only by receiving the highest per capita deliveries of subsidized oil in recent years, but also by re-exporting substantial amounts of that oil as refined products at higher world prices, a windfall that has been used to reduce hard-currency indebtedness.[30] As this protective cushion has deflated with the simultaneous rise in price and fall in deliveries of Soviet oil, they have been faced with many of the same difficult choices—between consumption and investment, reform and retrenchment—that confront the others, although probably still not with the same degree of urgency.

Next to Hungary, Bulgaria has been the most consistent of the East European countries in its pursuit of economic reform. Nonetheless, the Bulgarian "New Economic Mechanism," [31] which was introduced in its present form in 1981 and was aimed at improving both the efficiency and quality of industrial production, has fallen well short of expectations. Zhivkov himself has harshly criticized the poor quality of Bulgarian manufactures which, he admitted, is costing the country dearly on foreign markets as well as in terms of popular satisfaction and legitimacy. At a specially called national conference of the BCP in May 1983, he hinted that a new NEM might be introduced in 1984 and complained that: "Even those products that we began to produce under foreign licenses have been 'Bulgarized,' that is, we have put on them the imprint of [our] poor level of production." Other pressing problems include serious shortages of raw materials and labor (the latter the result in part of the export of thousands of skilled workers to the USSR and developing countries), a persistent housing shortage, and the inability of the agricultural sector (despite substantial investments) to keep pace with officially established consumption goals.[32]

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[29] Between 1972 and 1981, Bulgaria appears to have received far higher subsidies on a per capita basis that any other East European country except the GDR—one-third higher than Czechoslovakia, almost twice as Hungary, and four times as high as Poland; Vaňous, "East European Economic Slowdown," table 5. For a detailed discussion of Soviet subsidies to the East European economies, see Michael Marrese and Jan Vaňous, Implicit Subsidies and Non-Market Benefits in Soviet Trade with Eastern Europe (Berkeley, Calif.: Institute of International Studies, 1982).

[30] Wharton Econometric Forecasting Associates [WEFA], "Bulgarian Foreign Trade Performance in 1982," Centrally Planned Economies Current Analysis, vol. 3, no. 25 (April 7, 1983).

[31] For a detailed discussion of Bulgarian reform (not to be confused with the older more comprehensive Hungarian "New Economic Mechanism"), see Marvin R. Jackson, "Recent Patterns of Economic Development and Policy in Bulgaria," in volume 3.

[32] RFER, Bulgarian Situation Reports 2 (Feb. 11, 1983), 8 (July 7, 1983), 10 (Sept. 12, 1983), and 12 (Oct. 18, 1983); and "The Role of the Legal Private Sector in the Bulgarian Economy," RAD BR/175 (July 29, 1983).

These problems cannot fail to influence the coming succession, although at 73, Zhivkov has shown a greater willingness than most of his counterparts in the region to replace the dwindling coterie of leaders from his own generation (whose experience has been primarily in party and military affairs) with a younger and presumably more pragmatic group of administrators and economic specialists. In the most recent leadership shuffle, in January of 1984, the promotion of a half dozen prominent experts to top-level party and government posts, together with the merging of several economic ministries, seemed to reinforce the regime's commitment to continuing its moderately reformist course. As Western observers on the scene noted, the shake-up was clearly aimed at putting "economists with good reputations in front-line positions" in the hope of reversing the downward trend in performance.[33]

Nonetheless, as these younger leaders come to the fore, they may be less willing (or able) to pay the automatic obeisance to Soviet priorities that Moscow has been accustomed to. Already there are signs of diminished support for CMEA integration; for example, the Bulgarians were cool to the idea of a CMEA summit, no doubt fearing (with some justification) that their relatively strong economy will be called on to help support shakier neighbors and where they (and others) are certain to feel increased pressure from Moscow for hard-currency payment for Soviet energy exports. In addition, Sofia may be more reluctant in the future to undertake development projects in Soviet Third World client-states, especially in view of the threat to its investments in Iran and Iraq.[34]

Other forms that Bulgarian "deviance" might take are suggested by the example of Zhivkov's daughter, Lyudmila Zhivkova. Until her sudden death in 1981 at the age of 39, Zhivkova, who was apparently being groomed as a successor to party leadership, reflected a new spirit of national assertiveness that may not have been entirely welcome to the Kremlin.[35] More recently there are signs that Zhivkov himself, who has actively promoted the idea of a nuclear-free zone in the Balkans (no doubt as part of Moscow's anti-NATO campaign), is less than enthusiastic about the announced deployment of a new generation of Warsaw Pact missiles, for fear that it will further impede economic recovery and the expansion of ties with the West.[36]

In brief, what we are least likely to see in Bulgaria is instability in the form of overt popular unrest. No organized focus of opposition exists, whether within the church, the intelligentsia, or the working class. Moreover, the regime has shown itself quite capable of maintaining domestic order and, especially in the last 10 to 15 years, sensitive to the need to elicit and acceptable level of popular support through incremental material gains. The potential for instability is more likely to manifest itself in pressure on a new leadership to divert more of Bulgaria's strained resources to meet domestic needs at the expense of bloc priorities set in Moscow.

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[33] Richard F. Staar, Communist Regimes in Eastern Europe, 4th ed. (Standford, Calif.: Hoover Institution Press, 1982), pp. 40–41 and 46. Concerning the recent shake-up, see the Economist, Jan. 14, 1984, p. 43; and John Kifner's dispatch in the New York Times, Jan. 25, 1984.

[34] RFER, Bulgarian Situation Report/5 (Apr. 18, 1983); and the Economist, May 7, 1983, p. 33–34; and Kifner, loc. cit.

[35] Concerning Zhivkova and the continued use of nationalist historical themes in the official press for nearly two years after her death, see RFER, Bulgarian Situation Report/5 (Apr. 18, 1983). The unexplained "resignation" in September 1983 of Politburo member and CC Secretary Alexander Lilov, who was one of the younger members of the Bulgarian leadership (50) and was closely associated with Zhivkova, may signal that a lid is being put on this trend toward greater national and cultural assertiveness, although other developments suggest that the "Lyudmila effect" is still "alive and thriving"; see Patrick Moore, "Bulgaria in 1983," RFER, RAD BR/297 (Dec. 31, 1983), and Bulgarian Situation Report/1 (Jan. 16, 1984).

[36] The Economist, November 19, 1983, p. 54; and James M. Markham, "East Europe is Uneasy Over Missiles," the New York Times, Dec. 28, 1983.

## CZECHOSLOVAKIA

Since 1968, Czechoslovakia has been a major test case for the strategy of using rising levels of consumer satisfaction as a substitute for political liberalization. In the early 1960s, Czechoslovakia was the first East European country to experience an economic recession. In response, the proposed reforms aimed at revitalizing the system of economic planning and management also implied a basic rewriting of the social contract: the granting of a more active political voice to the population at the expense of a guaranteed level of well-being and job security regardless of the quality of work performed. By contrast, post-invasion "normalization" was based on what one seasoned observer has called the "three C's: coercion, consumerism, and circuses." Although the economy grew at a respectable rate while maintaining a low level of external debt throughout the 1970s, the reformers' emphasis on technological modernization of industrial production was sacrificed to yet another burst of extensive growth.[37]

Now twenty years after the first recession, Czechoslovakia is experiencing a second, this time accompanied by more intense competition among urgent social and economic priorities, and with little hope that political mechanisms can be used to mediate the resulting social tensions. The failure over the last 15 years to follow through on a program of industrial modernization (especially in the area of resource and energy conservation), together with renewed expansion (which merely added to energy requirements) left the Czechs acutely vulnerable to recent cuts in Soviet oil deliveries and shortfalls in Polish coal shipments. As a result of the gloomy energy outlook, industrial targets for the 1981–85 plan period have been adjusted downward at least three times so far, while the push to increase domestic coal production and speed up nuclear power development to make up for declining energy imports has further distorted an already skewed investment budget. Among the priorities denied resources will be industrial modernization (including the long-postponed modernization of the Szkoda Works for lack of hard currency), desperately needed measures to control pollution (now further aggravated by the intensified mining and burning of domestic soft coal), and agriculture (already experiencing a secular decline in per capita output as a result of past neglect and inappropriate development). Under the circumstances, consumption levels which continued to rise through 1981 will be difficult to maintain, and indeed began to slip in 1982.[38]

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[37] Vladimir V. Kusin, "Husák's Czechoslovakia and Economic Stagnation," Problems of Communism, vol. 31, no. 3 (May–June 1982), pp. 24–37; and the same author's RFER report, "The Inducement of Economic Depression in Czechoslovakia," RAD BR/66 (Mar. 19, 1982).

[38] Concerning overall economic performance, see: WEFA, "Czechoslovak Economic Performance in 1982 and in the First Quarter of 1983," Centrally Planned Economies Current Analysis,

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As in Bulgaria, these tensions are certain to affect the approaching succession, with the important differences that in Czechoslovakia leadership ranks have been far more static and that the issues are already more sharply delineated. Party leader Husák, now 71, presides over a leadership that has remained largely unchanged since it was installed during the post-invasion "normalization" period and that has steadfastly rejected all but the most timid gestures toward economic (not to mention political) reform. The "set of measures," the mini-reform introduced in 1980-81, has had no perceptible impact on the basic command structure or performance of the economy. The lone voice among the old guard urging more far-reaching reforms, Federal Prime Minister Lubomir Strougál, is reportedly seriously ill, while hopes for a stepped-up pace of change aroused by the 1981 appointment of Milos Jakes, a younger member of the CPCS Secretariat and Presidium, as chairman of the party's Economic Commission have proven at best premature.[39]

In the meantime, there is evidence of growing disquiet at other levels of the establishment over the debilitating effects of the present situation on the social climate. As one writer warned in late 1982:

> No really fundamental turning point in the economy can be reached in Czechoslovakia unless qualitative transformations are brought about in the overall social climate, at all levels and in all social groups. * * * The social climate that prevails at the moment is characterized by increased feelings of hopelessness. Many people are losing hope in the future.[40]

Among the symptoms and causes of this "hopelessness" are disturbing increases in rates of absenteeism, alcoholism and drug addiction, rampant corruption in virtually all areas of the consumer ecomomy, as well as other forms of social alienation; a rising incidence of public health problems associated with unchecked pollution; and widespread disgruntlement with the younger generation over changes in the educational system that are seriously limiting career choice and advancement. Equally distressing to the regime are the growing interest in religion among youth and the corresponding political apathy and passivity even among those who join the party.[41]

Although politically motivated outbursts of the type we have become accustomed to seeing in Poland are not typical of Czechoslovak behavior—witness the virtual absence of such displays during the Prague Spring in 1968—there are serveral aspects of the current political climate in Czechoslovakia that are reminis-

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vol. 3, no. 36 (May 17, 1983). See also the following RFER reports: on investment policy and energy problems, Czechoslovak Situation Reports 7 (Apr. 30, 1982), 5 (Mar. 16, 1983), and 11 (June 24, 1983); on agriculture, RFER, Czechoslovak Situation Reports 21 (Nov. 26, 1982) and 17 (Oct. 6, 1983); on the environment, Czechoslovak Situation Report/7 (Apr. 19, 1983) and RAD BR/62 (Mar. 24, 1983); and on consumer woes and inflation, Czechoslovak Situation Reports 3 (Feb. 14, 1983) and 9 (May 19, 1983).

[39] Concerning recent developments in economic reform see: "Who Scorns the Czechoslovak Mini-Reform?" and "What Next in Czechoslovak Economic Reform?" in RFER, Czechoslovak Situation Reports 12 (July 13, 1983) and 15 (Aug. 24, 1983). Concerning the leadership, see Starr, Communist Regimes in Eastern Europe, pp. 78-80; and Vladimir Kusin, "Undercurrents in Prague," RFER, Czechoslovak Situation Report/4 (Feb. 28, 1983).

[40] Jaromir Sedlák, "Social Climate," Hospodařské Noviny, no. 47 (Nov. 26, 1982), cited in Kusin, "Undercurrents in Prague."

[41] RFER, Czechoslovak Situation Reports 5 (Mar. 16, 1983), 7 (Apr. 19, 1983), (May 9, 1983), 15 (Aug. 24, 1983), 16 (Sept 13, 1983), and 21 (Nov. 26, 1983), and 2 (Feb. 6, 1984).

cent of the situation in Poland in the three-to-four years prior to the emergence of Solidarity:

> A widespread dissident movement within the church which, despite harsh repressive measures by the regime, has begun to turn out its own underground journals and is attracting a growing number of followers disillusioned by the unfulfilled promises of socialism; [42]
>
> The broadened scope of activities of the "Charter 77" movement, which in the past several years has begun to play a role not unlike that of KOR in Poland in the late 1970s, by acting as the spokeman for a wide variety of causes that otherwise might not have come to public (or Western) attention; [43]
>
> A burgeoning samizdat literature, going well beyond "Charter 77" or church sources, on a wide variety of literary, historical, and contemporary socio-economic issues; [44] and
>
> The emergence of several issues that could serve as vehicles for linking these dissident groups (the peace issue and Euromissile deployment as well as religious persecution) or even for building coalitions spanning establishment and opposition groups (the environmental and socio-economic crises).[45]

The Husák leadership's response to these diverse, if still inchoate, challenges has so far been the traditional mixture of coercion and exhortation, followed more recently by tentative moves to defuse the most immediate sources of dissatisfaction. The campaign of harrassment—directed first against "Charter 77" and, especially within the past year, against dissident clergy and lay activists—has proved largely counterproductive, the latter in particular bringing wide-spread protests. At the same time, the standard "mobilizational" techniques of indoctrination and exhortation have been ineffective in squeezing greater productivity out of the workers and, by mid-1983, the regime apparently decided that a more conciliatory approach was in order. Hence the surprising leniency with which it has treated lax labor discipline (at a time when the new Andropov leadership in Moscow was cracking down hard on similar abuses); hence also the unusual dose of *samokritika* that the Central Trade Union Council heaped on itself at its September session, in what can only be described as a transparent effort to spruce up its image as a guardian of worker rights. Still another indication of sensitivity to the popular mood was the unprecedented admission in the central party press in late October that it had received stacks of letters from citizens concerned over the Warsaw Pact's announced counter-deployment of medium-range nuclear missiles.[46]

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[42] Markham, "Signs of Religious Renewal"; also RFER, Czechoslovak Situation Reports 8 (May 9, 1983), 11 (June 24, 1983), 12 (July 12, 1983), 18 (Oct. 24, 1983), and 19 (Nov. 17, 1983).

[43] Among the issues that the "Charter 77" movement has actively pursued within the past few years are: peace and disarmament (circulating a position paper among delegates to the World Peace Rally in Prague in June); the environmental crisis (drawing up its own position paper); workers' rights (appealing to the ILO over violations); religious persecution (protesting harrassment of dissident clergy); rights of the Hungarian minority (publicizing cases of discrimination or harrassment); and nuclear power. See RFER, Czechoslovak Situation Report 5 (Mar. 19, 1983), 7 (Apr. 19, 1983), 11 (June 24, 1983), 12 (July 12, 1983), and 19 (Nov. 17, 1983).

[44] Ibid., Czechoslovak Situation Report/17 (Oct. 6, 1983).

[45] Vocal expressions of concern over the environmental crisis have come from at least three official organizations: the Economics Institute of the Academy of Sciences, the Czechoslovak Economic Society, and the Czechoslovak Bioclimatic Society. The first mentioned has also presented a critical report on the "fundamental structural" problems in the agricultural and food economy. Ibid., Czechoslovak Situation Report 7 (Apr. 19, 1983) and 21 (Nov. 26 1982).

This is not to suggest that we should look to the present leadership for substantive policy changes. Despite hints of disagreement from within the inner core, Husák and company appear determined to stay the "do-nothing" course, perhaps stalling for time in the hope of bequeathing the accumulated problems of the 1970s to their successors in the spirit of Louis XVI: "aprés moi, le déluge."

### THE GDR

Since the building of the Berlin Wall in 1961, reducing to a trickle the debilitating drain on its productive potential, the German Democratic Republic has become the most prosperous and stable country in the region. Among the contributing factors have been: first, Moscow's overriding interest in the stability of its most exposed Eastern European ally, where it maintains the bulk of its anti-NATO troop deployments and through which it gains access to badly needed Western technology—and which has, therefore, been a primary beneficiary of Soviet trade subsidies; second, the recognition on the part of the GDR's leaders that the only defense against the inevitable exposure of its citizenry to their more affluent and incomparably freer fellow Germans in the Federal Republic was to provide them with the highest standard of living in the bloc; and, third, a complex intra-German relationship whereby Bonn has been willing to trade important economic concessions (credits and special access to EEC markets) for expanded human contacts.[47]

In contrast to the situation elsewhere in the bloc, including in the Soviet Union itself, the overall rate of economic growth, at least as reflected in official statistics, has remained relatively stable and strong—4.4 percent in 1983 with similar projections for 1984, against an average annual rate of 5.4 percent in the 1971-75 plan period and 4.1 percent in the second half of the decade.[48] However, the weakening of its external support mechanisms over the last few years has shown that the GDR is by no means immune to the malaise afflicting its neighbors. Although by comparison with the "Polish virus" the GDR's problems seem scarcely more serious than a runny nose, the combination of growing economic distortions, stagnating living standards, and a selective but potentially significant rise in political assertiveness could increase domestic demands on the leadership in ways that will complicate relations with both East and West.

As has happened elsewhere, a heavy debt-service burden with the West together with the rising price and declining availability of Soviet oil (aggravated by shortfalls in Polish coal exports) pose both short and long-term dilemmas for East Germany's economic managers. Their immediate response to the energy squeeze has been stepped-up production of domestic brown coal (from approximately

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[46] Ibid., Czechoslovak Situation Report/18 (Oct. 26, 1983); and the Economist, Nov. 19, 1983, p. 54.

[47] Concerning the overall course of GDR-Soviet as well as intra-German relations, see Angela Stent, "Soviet Policy Toward the German Democratic Republic," in Terry, ed. Soviet Policy in Eastern Europe, pp. 33-60.

[48] Vaňous, "Eastern European Economic Slowdown," p. 3; the Wall Street Journal, Jan. 19, 1984; and Ronald D. Asmus, "The GDR in 1983," RFER, RAD BR/298 (Dec. 31, 1983).

250 million metric tons annually in 1976–80 to a projected 295 MMT in 1985 and 300 MMT in 1990), while longer-term plans call for the increasing substitution of nuclear power for coal (up to 20 percent of electric power generation in 1990 and 50 percent by 2000)—both involving a significant pollution burden (probably as serious a problem in the GDR as in Czechoslovakia) and the diversion of resources and labor from other pressing needs.[49] On the other hand, in trade relations with the West (especially the FRG), the effort to maximize exports and cut imports (especially of Western technology) is in direct conflict with such priorities as improved product quality, energy conservation and, especially important in the East German context, continued consumer satisfaction.[50]

These economic strains are appearing just as other sources of social and political disaffection are beginning to emerge: frustration, especially among the young, over restricted educational and career opportunities (related to low birth rates and the shortage of blue-collar workers); cynicism, again among the young, over an emigration policy that forbids working-age people to leave but seems almost to encourage emigration of pensioners; and popular aversion to the pervasive militarization of public life. Indeed, the peace issue, which the Honecker leadership has attempted to manipulate as part of Moscow's campaign against NATO nuclear modernization, appears to have backfired on the regime with the emergence of an independent peace movement opposed to new nuclear deployments by both West and East. There is also the potential that an environmental lobby will evolve out of the peace movement, along lines of the West German "Green" Party. To the extent that there is an organizational focus of these social concerns, it is provided by the Evangelical Church. It was undoubtedly the involvement of the church that protected the peace movement from official harrassment. In addition, the church has taken an active interest in a wide range of issues, organizing conferences and issuing position papers on such problems as disarmament, environmental pollution, alcoholism and suicide.[51]

Just how these still embryonic signs of political opposition might affect regime policy is not clear. So far, to the end of 1983, Honecker has not followed the example of neighboring Czechoslovakia, where there has been a severe crackdown on dissident church activists. On the contrary, over the last several years the East German church has won a degree of autonomy—including the right to build more churches and to celebrate the 500th anniversary of Martin Luther's birth—no doubt in part because the regime itself was intent on exploiting the latter celebration to enhance its own national image and legitimacy. In late October, the regime made the extraordinary concession of publishing dissenting church views on the missile question in the central party press.[52]

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[49] Cynthia B. Schultz, "The Energy Dilemma Confronting the GDR," RFER, RAD BR/48 (Mar. 11, 1983); concerning pollution problems in the GDR, see note 5 above, and Anna Tomforde, "The acid rain forests of West Germany," the Boston Globe, December 24, 1983. According to the last, environmental specialists believe that a significant percentage of West Germany's acid rain problem comes from the burning of brown coal in East Germany.

[50] Asmus, "The GDR in 1983," pp. 7–8; and Holmes, "Problems of 'Developed Socialism' in the GDR," pp. 4–7.

[51] Holmes, "Problems of 'Developed Socialism'," pp. 7–13; Markham, "Signs of Religous Renewal," also his "In Militaristic East Germany, the Pacifists Mobilize," the New York Times, Nov. 28, 1983; Asmus, "The GDR in 1983," pp. 1–5; also Asmus's other RFER reports: "East German Church Issues a New Document on Peace and Security," RAD BR/117 (May 20, 1983), and "Is There a 'Peace Movement' in Eastern Europe?" RAD BR/213 (Sept. 2, 1983).

Whether or not this relatively relaxed policy toward the church long outlasts the "Luther year" or the final decision on missile deployments on both sides, Honecker's own reservations over this new round in the European arms race suggest the potential for serious policy differences with Moscow. As with his lack of enthusiasm over the prospective CMEA summit, where together with Zhivkov of Bulgaria he feared the GDR might be called upon to help bail out the weaker members, the East German leader's motives here are primarily economic. Already the GDR's official defense budget is scheduled to rise by 7.7 percent in 1984, nearly twice the expected rate for the economy as a whole. In addition, East Germany's urgent need for continued Western (primarily West German) financing is reflected in Honecker's anxiety not to let the deepening East-West chill spill over into intra-German relations. Such nuances are not necessarily in conflict with the Soviet goal of widening rifts within the Western alliance, especially between the FRG and the United States. On the other hand, it is also possible that the leadership hiatus in Moscow, together with the recall of Soviet Ambassador Abrasimov (long regarded as an imperial viceroy of sorts), has inaugurated a period in which policy coordination will not be as close as in the past.[53]

How these issues might influence or be influenced by a change of leadership in East Berlin is not easy to predict. Among Eastern Europe's septuagenarian leaders, Honecker, who turned 72 in 1984, is reputed to be the most vigorous. At the same time, the fact that he presides over a politburo that includes only one new voting member in the last decade suggests that, when the change comes, turnover at the top could be rapid.[54] The one thing that can be said with certainty is that a new leadership will not have much time to perfect its balancing act in the complex triangular relationship ~~with Moscow~~ and Bonn. With the rapid disappearance of Soviet subsidies and the generally taut economic situation within CMEA, no East German leader can allow superpower politics to interfere with intra-German relations, which now provide the only source of external relief for the strained GDR economy. But neither can he afford to stray far from the Soviet fold, for fear that too close an association with the Federal Republic will erode the legitimacy of a separate East German state.

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[52] The Economist, Nov. 12, 1983, p. 58; and the following reports in RFER by Ronald D. Asmus: "Opening of Luther Celebrations in the GDR," RAD BR/100 (May 9, 1983), "Honecker on Luther Year Celebrations," RAD BR/248 (Oct. 21, 1983), and "Neues Deutschland Prints Dissenting Views on Arms Control," RAD BR/254 (Oct. 31, 1983).

[53] See, e.g., Markham, "East Europe Uneasy Over Missiles"; Asmus, "The GDR in 1983," pp. 7–8 (on Abrasimov's recall and the defense budget); and the Economist, May 7, 1983, pp. 33–34 (on CMEA). Concerning intra-German relations, especially efforts to maintain cooperation despite strains in East-West relations, see: Frederick Kempe, "The Two Germanys Build a Relationship in Spite of U.S.-Soviet Strains" and Roger Thurow, "Bonn Loan Pulls Two Germanys Closer Together," the Wall Street Journal, Sept. 16 and 19, 1983; and James M. Markham, "East Germany Tries Accommodation," the New York Times, Feb. 1, 1984.

[54] Staar, Communist Regimes in Eastern Europe, pp. 106–107; and RFER, "East European Leadership List," Sept. 12, 1983.

## HUNGARY

The contrasts between the Hungarian and Polish situations are especially illuminating. In 1956, Poland emerged the apparent victor, extracting important concessions from Moscow, while Hungary's revolt was crushed in a brutal Soviet invasion. Yet nearly thirty years later, Hungarian party chief Kádár not only remains in power but has introduced more extensive and enduring economic reforms than in any other East European country. Indeed, he is the only leader in the bloc who can be said to enjoy a modicum of genuine popularity, a direct result of the fact that the population enjoys adequate supplies of foods and other consumer goods as well as a relaxed political climate. In the meantime, Poland has experienced repeated crises, three changes in the top-level leadership, and no lasting reform.

Although there has been a good deal of speculation about the applicability of the "Hungarian solution" to other centrally planned economies, careful analysis of Kádár's relative success suggests that, just as the sources of Poland's recurrent instability are complex and in important respects unique to that country, so too the introduction of Hungary's New Economic Mechanism (NEM) in 1968 and its partial survival over the next decade were due to a fortuitous combination of circumstances that cannot easily be replicated. In particular, the Hungarian experience suggests that reform of the East European economies is a lengthy and delicate process, both economically and politically, requiring a high degree of policy consistency both at home and in Moscow. From the economic point of view, the establishment of some degree of equilibrium (especially a restructuring of investment priorities in favor of long neglected consumer sectors) would seem to be a prerequisite to implementation of genuine reforms, if those reforms are not to bring unacceptable levels of inflation and (however temporary) unemployment. It is worth recalling that in pre-NEM Humgary this preparatory period extended over more than half a decade. From the political point of view as well, effective reform requires a gradual weeding out of party and government officials who have opposed past reform efforts, as well as the neutralization of those elements who might be tempted to push the reforms beyond acceptable limits. In the Hungarian case, the total collapse of the Stalinist party in 1956, the simultaneous defeat and emigration of genuinely liberal elements, together with the subsequent support that Kádár enjoyed vis-à-vis his domestic hardliners from both Khrushchev and (at least until 1971) Brezhnev, were all essential ingredients in the implementation of the NEM. Yet even this did not protect Hungary from both external and domestic pressures during the 1970s.

Both in and outside of Hungary, there are fears that the remarkable stability that has accompanied Kádár's long tenure cannot outlast him. Of all the East European countries, Hungary's terms of trade have suffered most from spiraling energy and raw material prices. With per capita hard-currency debts even higher than Poland's, and under pressure from the International Monetary Fund to impose austerity measures at home, overall economic activity (Gross Domestic Product) rose by a mere 0.8 percent in 1983, and domestic consumption increased by only 0.5 percent. As a result of import restrictions, mediocre industrial performance, and a severe drought, even low plan targets were not met in many sectors. In particular, gross crop output dropped by 9.3 percent contributing to significant cuts in hard-currency earnings.[55]

For the better part of two decades, Kádár's shirt-sleeve populist style of leadership—his unusual candor concerning the causes of the country's economic difficulties, his promises to protect basic consumer supplies, and his somewhat unorthodox economic policies which provided some outlets for private initiative—allowed the regime periodically to raise prices and hold down real incomes without the social outbursts that accompanied similar attempts in Poland. Similarly, his relative tolerance of criticism within the system relegated political opposition to marginal significance.[56] As elsewhere, however, the strains on the basic social contract now threaten to give rise to a more visible and organized dissident movement encompassing a broad range of social and political issues: an independent "Peace Group for Dialogue"; advocacy by dissident clergy of conscientious objection to military service; a burgeoning samizdat, or underground publishing activities; and, perhaps most alarming for the regime, a revival of intellectual interest in the fate of Hungarian minorities in neighboring countries, including recent protests over the treatment of Hungarian nationals in Czechoslovakia and Romania. Even the HSWP has not been immune to dissent, as evidenced by Kádár's recent references to "erosion in the party's ranks" and his admonition to members at all levels to fall in line behind the leadership.[57]

The regime's response to these challenges both on the economic and on the political front has been discrete. On the one hand, it has come down relatively hard on openly dissident groups: When the "Dialogue Group" refused to merge with the official National Peace Council, it was harrassed into disbanding; dissident intellectuals, accustomed to fairly lenient treatment, suddenly found their apartments raided and materials confiscated, especially if they had strayed into the explosive issue of nationality relations. At the same time, Kádár's reaction to economic adversity has not been retrenchment; on the contrary, he seems intent on pushing ahead with a further liberalization of Hungary's already unorthodox economy (although not with the full-scale "reform of the reform" that some of his economic advisors want). He is also committed to restoring a measure of public consensus not by stifling political debate, but by a modest expansion of opportunities for interest articulation and participation (e.g., the recently unveiled electoral reform, increased autonomy for the trade unions, and the apparent willingness of the leadership to grant the church a somewhat broader role in exchange for help in solving pressing social problems). Yet, implementation of these reforms is certain to aggravate Kádár's problems with party conservatives (and some within the working class) for whom his economic reforms represent unacceptable deviations from socialist ideological principles.[58]

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[55] Vañous, "East European Economic Slowdown," pp. 4-5; WEFA, "Hungarian Economic Performance During the First Half of 1984," Centrally Planned Economies Current Analysis, vol. 4, no. 67 August 29, 1984.

[56] For a comparison of Kádár's leadership style and strategy with Gierek's in Poland, see Sarah M. Terry and Andrzej Korbonski, "The Impact of External Economic Disturbances on the Internal Politics of Eastern Europe: The Polish and Hungarian Cases," in the Impact of International Economic Disturbances on the Soviet Union and Eastern Europe: Transmission and Response, Egon Neuberger and Laura D'Andrea Tyson, eds. (New York: Pergamon, 1980), pp. 375-408. Concerning the muted character of Hungarian dissent in the 1970's, see George Schöpflin, "Opposition and Para-Opposition: Critical Currents in Hungary, 1968-78," in Opposition in Eastern Europe, Rudolf L. Tokes, ed. (Baltimore: Johns Hopkins University Press, 1979), pp. 142-86.

[57] See, e.g., the following Hungarian Situation Reports from RFER: 12 (Aug. 30, 1983), on the independent peace movement; 13 (Sept. 19, 1983), on church-state relations and growing church activism; and 3 (February 8, 1983) and RAD BR/111 (May 17, 1983), on intellectual dissent. On the national question, see RFER, Czechoslovak Situation Report/5 (Mar. 16, 1983); on the whole range of issues including opposition to Kádár's policies within the HSWP, see Robinson, "Hungary in 1983," and Tokes, "Reform or Movement," pp. 24-28.

A final element of uncertainty on the domestic front is Kádár himself, who turned 72 in 1984. Although Hungary has to be ranked with Bulgaria and the GDR as a basically stable country over the last quarter century, that stability has been more closely linked with the personality and policies of a single leader. Thus, while he has made a more concerted effort than the other elder statesmen of the bloc to promote a new generation of leaders to top policy-making positions, it is questionable whether he will be able to bequeath to a successor either his style of leadership or the relationship of mutual confidence and candor that he has established both with the Hungarian population and the overlords of the Kremlin. In particular, fears center on the possibility that disgruntled hardliners within the party will use the succession to try to stage a comeback, provoking a factional struggle with unpredictable consequences for domestic and foreign policy.[59]

On the international front, the Hungarians must continue to walk the narrow line between the sometimes incompatible requirements of loyalty to Moscow and expansion of economic ties with the West. Despite a successful visit to Moscow in July 1983, during which Kádár apparently received a cautious go-ahead for his continuing reforms, Andropov's death may signal another hiatus and reassessment (especially in view of well-known reservations over Kádár's policies in Prague and East Berlin). In the meantime, other sources of tension in bloc relations include: reductions in Soviet oil deliveries and declining terms of trade, both of which further burden the Hungarian economy; increased pressure for integration within CMEA according to traditional command principles, which tends to undercut Hungary's reforms at home; and the rising pitch of East-West confrontation, which not only threatens to impose an increased defense burden on the economy but runs counter to Hungary's urgent need for continued financing from and trade with the West. On this point, Kádár's determination to minimize the effect of the superpower chill on his country's ties with the West was demonstrated in a flurry of diplomatic activity in late 1983 and early 1984, with high-level visits to and from the United States, Britain, West Germany and Italy.[60]

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[58] Concerning the crackdown on various forms of dissent, see the sources cited in the previous note; also John Kifner, "Hungary Cracks Down on Dissident Groups," the New York Times, Nov. 20, 1983; and RFER, Hungarian Report/1 (Jan. 12, 1984). Concerning ongoing reform efforts, see notes 12 and 14 above; also "Into Entrepreneurial Socialism: A Spectre is Stalking Hungary," the Economist, Mar. 19, 1983, pp. 23-31; and Alfred Reisch, "The Illusion and Reality of 'Independent' Trade Unions," RFER, RAD BR/276 (Dec. 21, 1983).

[59] Staar, Communist Regimes in Eastern Europe, pp. 136 and 140-41. On the man and his political legacy, see the following RFER reports on the occasion of Kádár's 70th birthday in May 1982: William F. Robinson, "Kádárism—Is it Here to Stay?" RAD BR/122 (May 25, 1982), and Carlo Kovats, "Janos Kádár: The Man and the Politician on his Seventieth Birthday," RAD BR/123 (May 25, 1982).

## ROMANIA

Of all the East European countries, Romania betrays the closest resemblance to Poland in its past economic policies and present difficulties. Not surprisingly, then, Romania is often identified as the most likely locus of next major political crisis in the region. At the same time, the strict control that Ceauşescu maintains over his party and potential sources of internal opposition, together with the concern shared by elites and population alike that domestic divisiveness could invite Soviet interference, makes any predictions concerning stability or instability in that country, not to mention the forms that such instability might take, highly problematic.

As in Poland, an excessively ambitious program of industrial expansion, unaccompanied by efficiency-oriented reforms in the system of economic planning and management, led to a growing reliance on costly imported resources and technology. As Romania's external debt burden grew (to an estimated $10 billion in 1982), the government slashed hard currency imports (reportedly by as much as one-third in 1982 alone) and maximized exports at the expense both of industrial production and especially of domestic consumption (which may have dropped by as much as 12-14 percent in real terms in 1983). Unlike the Polish economy after 1978, the Romanian economy has continued to grow, at least according to official statistics. But the rate of growth has fallen dramatically not only from the rates achieved in the 1970s (11.3 percent per year in the 1971-75 period and 9.4 percent in 1976-80), but also relative to plan targets for 1981-85. Moreover, as imports shrink and exports rise, choke-points have emerged not unlike those that brought Poland to the brink of economic and political collapse in 1980: in particular, energy, industrial inputs and spare parts, transportation, and food supplies.[61]

Of these, the energy shortage is by far the most critical and, as in Poland, threatens to bring the rest of the economy down with it. A centerpiece of Romania's development strategy was the expansion of refinery capacity to process Middle Eastern as well as domestic crude, much of it for resale on world markets as a source of hard currency for Western technology imports. The prolonged war between Iran and Iraq (Romania's main Middle Eastern suppliers), their own hard-currency problems (curtailing replacement of crude imports and encouraging continued exports of refined products) as well as declining domestic production, have combined to confront the Romanians with idle refining capacity and an acute shortfall of energy for domestic consumption. Resulting power cuts have led to disruptions in production schedules, damage to sensitive industrial equipment and, in December 1983, to a draconian decree (backed up by threats to confiscate appliances or shut off power) imposing a 50 percent cut in personal use of electricity by the population. In addition, frantic efforts to overcome the shortage—by reopening old wells, investing in new drilling equipment, and setting wholly unrealistic targets for coal extraction—have been extremely costly both in terms of hard-currency outlays and opportunity costs as scarce investment resources are drained away from needed industrial and social investments.[62]

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[60] On Kádár's visit to the Soviet Union, see Alfred Reisch, "Kádár Policies Get Seal of Approval from New Soviet Leadership?" RFER, RAD BR/195 (Aug. 11, 1983). On CMEA and oil: the Economist, May 7, 1983, pp. 33-34; and Amity Shlaes, "Soviet Bloc Squabbles at Recent Parley Show Divisions Over Moscow's Oil Policy," the Wall Street Journal, Nov. 23, 1983. On recent developments in relations with the West: Robinson, "Hungary in 1983," p. 10; the Economist, February 11, 1984, pp. 45-46; and RFER, Hungarian Situation Report/1 (Jan. 12, 1984).

[61] WEFA, "Review of the Second Romanian Economic Memorandum to Western Banks—Part I: General Remarks and the Balance-of-Payments and Debt Developments," Centrally Planned Economies Current Analysis, vol. 3, No. 22 (Mar. 29, 1983).

Among the sectors that have been shortchanged are agriculture, housing, education, health care and scientific research. Agriculture in particular, despite systemic differences, shows deficiencies reminiscent of Polish agriculture in the 1970s: the migration of the most able young workers to expanding industries, the unwillingness of peasants to perform unremunerative work on collective farms, "penny-wise pound-foolish" cuts in fertilizer imports, the inability of domestic industry to supply essential equipment and machinery, and the push to maximize exports at the expense of already meagre domestic food supplies. By all accounts, the retail food situation in Romania is worse than in Poland at any point in its recent crisis, and rations for meat and flour were again cut at the beginning of 1984. To date, the leadership's response has been a ludicrous attempt to convince the population that the reduced food rations represent a scientifically healthier diet.[63]

Ceauşescu, like Gierek before him, has rejected suggestions that faulty economic policies are in any way responsible for Romania's woes, preferring to blame external factors and lax discipline at home. To the extent that he has been willing to contemplate reform at all (the word "reform" is assiduously avoided by the Romanian press), genuine decentralization or the introduction of meaningful financial controls over industry has been postponed in favor of the imposition of severe austerity measures on a population already burdened with the lowest living standard among the CMEA-6. In addition to the energy cuts and food shortages noted above, the regime has been whittling away at standard social welfare services that have long been taken for granted as automatic benefits of socialism. In such areas as health care, housing, education and day care, levels of service have either been reduced or the population is being required to contribute on a fee-for-service basis for benefits previously provided free of charge or at nominal cost. Potentially the most damaging "reform" was the scrapping in late 1983 of the guaranteed minimum wage and its replacement by an official wage "increase" linked to plan fulfillment—an Orwellian formula that in present economic circumstances (with rampant shortages of energy, materials, and parts) is almost certain to lead to a further decline in real incomes.[64]

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[62] See, e.g., ibid.; John P. Hardt, "Soviet Energy Policy in Eastern Europe," in Terry, ed., Soviet Policy in Eastern Europe, p. 217; and RFER, Romanian Situation Report/17 (Oct. 10, 1983). In particular, projections for increases in coal extraction are wholly unrealistic; 1983 production was probably on the order of 43 million metric tons (MMT), slightly below the 1982 goal and far short of the 60 MMT target originally set for 1983; attainment of the 1985 goal of 87 MMT would require annual increases in excess of 40 percent. Similarly, efforts to reduce crude oil imports from 16 MMT in 1980 and 10.9 MMT in 1982 to 1.5 MMT in 1983 were only partially successful; preliminary estimates indicate 1983 imports of about 6 MMT; RFER, Romanian Situation Report/20 (Dec. 31, 1983), p. 21.

[63] Concerning cuts in investment, see RFER, RAD BR/54 (Mar. 15, 1983). Concerning agriculture, RFER, Romanian Situation Reports 13 (July 28, 1983), 18 (Oct. 27, 1983), and 20 (Dec. 31, 1983), p. 19; and the Economist, Feb. 11, 1984, p. 46.

While it might be tempting to carry the analogy into the political arena, the similarities between Poland and Romania end here. As a latecomer to industrial development (even in East European terms), Romania has no tradition of working class activism; there is no coherent dissident movement among the intellectuals, much less the prospect of a worker-intellectual alliance; the dominant Orthodox Church has generally been a pliant tool of the regime. In brief, Romania shares none of the social or institutional mechanisms that have served to focus and channel discontent in Poland, and that are beginning to provide the basis for nascent opposition elsewhere. True, strikes have occurred, the best known being the coal miners' strike in the Jiu Valley in 1977. But Ceauşescu has handled such localized outbursts in typically Soviet fashion: by isolating the affected area, mollifying the strikers with temporary material concessions (generally improved food supplies), followed by ruthless suppression.

Over the past two decades, Ceauşescu has succeeded in imposing this neo-Stalinist regimen of material hardship and political repression by combining it with a carefully orchestrated campaign of national assertiveness in both foreign and domestic policies. Following the example of his predecessor Gheorghiu-Dej, whose rejection of Khrushchev's plan to transform CMEA into a supra-national planning organization and re-Romanization of Romanian culture and history first provided the regime with broad popular support, Ceauşescu has consistently used limited defiance of Moscow coupled with frequent appeals to national sentiment to counterbalance popular dissatisfaction with conditions at home. That he hopes to continue this tactic to ride out the present economic crisis is evident from his noisy exploitation of the Euromissile and peace issues, on which the Romanian regime has broken ranks with the other members of the Warsaw Pact to condemn missile deployments by both West and East and has attempted to rally popular support through officially-sponsored mass demonstrations.

Whether Ceauşescu's maverick image and international visibility will again be sufficient to maintain domestic quiescence and his personal position is open to question on several grounds: First, the credibility of his independent foreign policy stance could soon run afoul of Romania's urgent need for Soviet oil and additional economic concessions from CMEA, leaving the regime vulnerable to pressures to bring its policies more into line with Moscow's preferences.[65] Second, in view of the drastic nature of recent austerity

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[64] Concerning the Ceauşescu regime's denials of blame, see WEFA, "Review of the Second Romanian Memorandum—Pt. I"; and RFER, Romanian Situation Report/20 (Dec. 31, 1983), pp. 25–27. For a fairly candid discussion of the ineffectiveness of the Romanian "New Economic Mechanism," formally introduced in 1978, see the report of a roundtable organized by Era Socialista (no. 5, Mar. 10, 1983) in RFER, Romanian Situation Report 14 (Aug. 16, 1983). Concerning cuts in social services, especially the recent introduction of a two-tier heath-care system, see ibid., Romanian Situation Report/18 (Oct. 27, 1983); on changes in accessibility of higher education, see note 23 above. Concerning the September 1983 change in wage policy, see ibid., Romanian Situation Report/17 (Oct. 10, 1983); and the Economist, Sept. 17, 1983, p. 60.

[65] See, e.g., the Economist, May 7, 1983, pp. 33–34; Shlaes, "Soviet Bloc Squabbles." According to the Economist (Feb. 11, 1984, p. 46), Moscow agreed in early February 1984 to provide Bucha-

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measures—which apparently go well beyond the recommendations or conditions set by the International Monetary Fund—Ceaușescu's strategy could well backfire on him by further reducing worker motivation and productivity, with obvious implications for living standards and export potential. Should this occur, social unrest in some form is almost a certainty, most likely in a repetition (perhaps on a much broader scale) of the Jiu Valley strikes, but in all probability lacking the organizational cohesion that gave Solidarity its staying power.[66]

The third and most problematic question concerns the possibility of a challenge to Ceaușescu's leadership from elites appalled by the economic disarray around them and offended by the ever growing cult of the Ceaușescu family. The problem is identifying a group or groups from which an effective challenge might come. The Romanian leader has so far been clever enough to preempt any potential opposition—most recently, according to rumor, within the military officer corps—before it can organize itself. Moreover, the common elite interest in maintaining both national unity against possible Soviet interference and the party's monopoly of political power within the country provides strong incentive not to rock the boat. Thus, the odds seem to favor a continuation of the Ceaușescu regime and a further postponement of any reckoning with the explosive legacy of his rule.[67]

## V. CONCLUSION: THE VIEW FROM THE KREMLIN

From the vantage point of the current Kremlin leaders, the view of their East European allies must be a sobering one. During the 1970s, Soviet policy was based on confidence that they had found a formula for long-term stability in the region, one that would promise both economic growth and political cohesion but without the risks of unacceptable political reforms. In brief, Brezhnev's strategy of alliance management, which grew directly out of the Czechoslovak challenge of 1968 and the Soviet Union's enhanced global capabilities and ambitions, consisted of three mutually reinforcing strands: (1) East-West detente with the attendant increases in credit-financed trade and technology transfer to both Eastern Europe and the USSR; (2) a reassertion of Soviet ideological initiative, more in a negative then a positive sense—that is, less in order to impose rigid orthodoxy or conformity (what must be) than to place limits on systemic diversity (what must not be); and (3) renewed emphasis on economic integration within CMEA, soon expanded to include a number of Moscow's Third World clients.

In a superficial sense the latter two elements, stressing economic and ideological cohesion, may have appeared incompatible with the atmosphere of detente. In the Soviet mind, however, the three ele-

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rest with 1.5 MMT of oil on the same barter terms as it sells oil to the other East European countries, not as much as Romania wanted but perhaps enough to influence Romanian behavior.

[66] RFER, Romanian Situation Report/20 (Dec. 31, 1983), p. 19.

[67] See Mary Ellen Fischer, "Nicolae Ceaușescu and the Romanian Political Leadership: Nationalization and Personalization of Power," the Edwin M. Moseley Faculty Research Lecture, 1982 (Saratoga Springs, NY: Skidmore College, 1983), pp. 40–46. Concerning Ceaușescu's success in minimizing elite opposition to his policies, especially his practice of "rotating cadres," see Robert R. King, History of the Romanian Communist Party (Stanford, CA: Hoover Institution Press, 1980), pp. 94–97.

ments were not only compatible, but each was the necessary complement of the others. Specifically, in the absence of comprehensive Czech-type reforms the essential improvements in the region's economic performance could be had only at the price of substantial increases in trade and technology transfer from the West. On the other hand, if Moscow were going to allow Eastern Europe's participation in detente, then prophylactic measures had to be taken to forestall ideological erosion. The third element, the tightening of CMEA ties through the 1971 Comprehensive Program and subsequent joint investment plans, was intended to ensure that expanded trade links with world markets would not be at the expense of Moscow's long-term development plans or Eastern Europe's support of its Third World activities.

The failure of Brezhnev's strategy—of which Poland is only the most dramatic example—is forcing his successors to find a new formula at a time of heightened tensions and narrowing options. A principal tool in the Kremlin's alliance management kit has traditionally been the selective application of economic bandages to ward off the unwanted infection of political change. In the past, however, Moscow's ability to maintain both stability and systemic conformity in Eastern Europe, and to contain its periodic crisis, has been facilitated by two factors: first, that at any one time a crisis has been limited to a single country (even in 1956 the climax of the Polish events has passed before the Hungarian situation got out of hand); and second, that despite the shortcomings of its own economy Soviet resources have always been sufficient to tide over a faltering regime and, especially in the 1970s, to shelter the bloc as a whole from external economic shocks.

Neither of these conditions seems likely to hold in the foreseeable future. On the one hand, the pervasiveness of the region's economic malaise increases the possibility either that crises may erupt spontaneously and more or less simultaneously in two or more countries, or that the ripple effects of a crisis in one may be enough to tip the balance in others (just as the collapse of Polish coal exports in 1981 caused serious dislocations in energy supplies and industrial production in the GDR and Czechoslovakia). On the other hand, the cost of the region's crises has escalated sharply in recent years,[68] beyond the willingness and perhaps even the ability of the Soviet economy to absorb. While the Soviets may be willing, as some analysts suggest,[69] to continue providing a modest level of assistance on a selective basis, generous rescue packages and the blanket granting of large trade subsidies are clearly a thing of the past.

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[68] The example of Poland's three most recent crises is instructive. Following the December 1970 crisis, a Soviet hard-currency loan of $100 million was apparently sufficient to overcome the immediate difficulties (in part because it was soon supplemented by the influx of Western credits). In the wake of the June 1976 food price riots, Soviet aid was reportedly on the order of $1.3 billion in ruble and hard-currency loans, plus an increase in oil deliveries at the subsidized intra-CMEA price; by then, the 1971 aid package of $100 million would have been enough to cover a mere two months' interest on Poland's burgeoning Western debt. No firm figures on overall Soviet aid to Poland since August 1980 are available; however, when trade credits, increased deliveries of energy and raw materials, and (at least in the early months of the crisis) help in meeting debt service are added up, the total through the end of 1982 was almost certainly in excess of $5 billion. Soviet bloc assistance to Poland directly related to the crisis amounted in 1980 and 1981 to at least $3.1 billion, almost all coming from the U.S.S.R. itself. Poland's trade deficit with the Soviet Union in 1982 likely added another $1.5 billion, and this figure does not include price subsidies on Soviet energy and raw material exports, which result from the standard CMEA price formula and are unrelated to the crisis. See Elizabeth Ann Goldstein, "Soviet Economic Assistance to Poland, 1980–81," in Soviet Economy in the 1980s: Problems and Prospects, Selected papers submitted to the Joint Economic Committee, Congress of the United States, Part 2 (Washington, D.C.: GPO, 1983), p. 567; and Andrzej Korbonski, "Soviet Policy Toward Poland," in Terry, ed., Soviet Policy in Eastern Europe, pp. 89–90.

Thus they are faced with a disagreeable choice between two options, both of which have been rejected in the past as either too costly or politically unacceptable. First, they could ease the strains on the region's economies by allowing these countries to reduce their contributions to such "common" goals as Warsaw Pact defenses, the long-term target programs within CMEA, and economic assistance to the less developed members of CMEA. Apart from official defense budgets (which may significantly understate overall military expenditures by the East Europeans), these contributions to bloc-wide programs are impossible to quantify.[70] But there is some evidence to suggest that they impose a considerable burden, distorting investment plans to suit Soviet-defined priorities and generally diverting resources from pressing domestic needs. Second, the Soviets could reverse their alliance management formula of the 1970s; that is, instead of using economic concessions to maintain political stability and prevent unwanted systemic change, they could begin using political concessions as a safety valve for present economic strains.

Such an approach would not be entirely unprecedented. There is ample evidence of Soviet tolerance for limited nonconformity (and occasional insolence) from its East European allies where the benefits to bloc stability seemed to outweigh the risks. One need only recall the concessions to private agricultural and church in Poland after 1956, to economic flexibility in Hungary, and to national reassertion in Romania. Thus, it is possible (in several cases probable) that some of the recent departures from orthodoxy—the acknowledgment of dissenting views on the missile question, conciliatory gestures toward the church, the GDR's eagerness to maintain intra-German rapprochement, or Hungary's cautious political reforms and diplomatic offensive in the West—had Moscow's blessing in advance, not only because they could reduce domestic political tensions but because they served the Soviet goal of maintaining links to the West European countries in a period of superpower confrontation. Yet concessions to domestic sensitivities (whether approved by Moscow or not) have so far been cosmetic and cannot begin to solve the region's fundamental structural problems, while tolerance of expanded ties with the West carries long-term risks for bloc cohesion.

To date, there is scant evidence that the Kremlin leaders have come to grips with the core dilemmas of Eastern Europe's instability—either that they fully appreciate the systemic straitjacket in which the policies of the 1970s have left these countries, or that they are now capable of making the political and/or economic concessions that will be necessary to pull them out of their present malaise. Andropov's death, barely fifteen months after he took office, and the appearance of yet another transitional leader in the person of Konstantin Chernenko only complicate Moscow's problems of alliance management by prolonging the uncertainties and indecision. Moreover, with the all important lubricant of CMEA integration—i.e., plentiful supplies of cheap Soviet oil—a vanishing commodity, centrifugal forces are fraying the fabric of the alliance as each member seeks to use the organization to solve its own problems.

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[69] Vaňous, "East European Economic Slowdown."

[70] See, e.g., Sarah M. Terry, "The Soviet Union and East Europe: Implications for U.S. Policy," in Soviet International Behavior and U.S. Policy Options, Dan Caldwell, ed. (Lexington, MA: Lexington Books, 1984), notes 13, 14 and 29. See also RFER, Czechoslovakia Situation Report/1 (Jan. 17, 1984).

The question of the much postponed CMEA summit—the first full-dress summit since 1969—is a case in point. For more than three years after the idea was broached by Brezhnev at the 26th CPSU congress in February 1981, member states were unable to work out a mutually acceptable agenda, with each party nursing its own set of expectations and anxieties: the Poles seeking a comprehensive aid package to put their economy back on its feet; the Romanians looking for increased food and raw material imports at concessionary prices, lest their economy go the way of Poland's; the Hungarians, understandably concerned that renewed emphasis on integration and joint planning would undercut their plans for expanding ties with world markets, continuing to press for bloc-wide price reform and currency convertibility; the Czechs, who had been pushing for a summit, also critical of existing mechanisms of integration; the East Germans and Bulgarians least interested of all, perhaps because in view of the relative strength of their economies they feared they would end up footing the bill for any concessions to the others, with the GDR in particular anxious to protect its special relationship with West Germany. Despite the special interests dividing them, however, the most serious sources of disagreement appeared to be those uniting the East Europeans against Moscow: first, the sharp increase in price of Soviet energy exports through 1983 and hints that the Soviets might press for further cutbacks in oil deliveries or part payment in dollars; and second, fears that proposals for "rationalizing" CMEA through closer plan coordination, stepped-up specialization and the establishment of "joint enterprises" would further compromise their economic autonomy.[71]

The immediate results of the summit, which was finally held in June 1984, fell short of everybody's hopes and/or apprehensions. Moscow agreed to move toward world market pricing for its oil, which under the old intra-CMEA formula had exceeded world levels by 1983; in return, the East Europeans acceded to long-standing Soviet demands that they provide higher quality consumer goods and industrial machinery. In addition, all parties agreed in principle to a program of intensified economic coordination and integration, including joint efforts to cut energy consumption and to develop such high-tech industries as microprocessors and robotics. Behind the facade of vaguely worded commitments to unity and cooperation, however, the most vexing issues remained unresolved. Moscow appears to have been unsuccessful in imposing an enhanced CMEA role in coordinating bloc economies. At the same time, the East Europeans failed to extract commitments to restore oil deliveries (cut by 10 percent in 1982), to move toward ruble convertibility, or to reduce the burden of defense costs. In addition, the decision of the summit to upgrade the status of CMEA's three non-European members (Mongolia, Cuba, and Vietnam) implies an increased economic assistance burden for the more developed members.[72]

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[71] The Economist, May 7, 1983, pp. 33-34. For other reports on preparations for the summit, see John F. Burns, "Deep Strains in Comecon," the New York Times, May 10, 1983; and RFER, Czechoslovak Situation Reports 7 (Apr. 19, 1983) and 9 (May 19, 1983).

It has not taken long for tensions to resurface. Already before the summit, a debate erupted within the bloc over the proper place of "national interests" as opposed to "the principles of socialist internationalism" in determining the policies of individual socialist states. Started in January by the Hungarians, and supported (somewhat surprisingly) by the East Germans and (less surprisingly) the Romanians, the debate reflects divergencies over the growing chill in East-West relations between those countries who are more dependent on economic ties with the capitalist world and those who favor autarkic policies.[73] Within weeks of the summit's close, Mocow was attacking West Germany's alleged "revanchist" tendencies—attacks that were generally interpreted as indirect criticism of the GDR and a sign of anxiety over the latter's rapproachement with the FRG.[74] July brought additional indications of displeasure over Polish attempts to end Western sanctions by an amnesty for Solidarity activists and advisers.[75] Yet, as of midsummer 1984, nowhere was it evident that an aging and stalemated Kremlin leadership was prepared to deal effectively with these challenges.

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[72] See reports on the summit in the Wall Street Journal, June 11, 13, and 15, 1984; and the New York Times, June 15 and 16, 1984.

[73] See, e.g., Alfred Reisch, "New HSWP Interpretation of Communist National and International Interests," RFER, RAD BR/23 (Feb. 16, 1984); and Sallie Wise, "CPSU Journal Outlines Soviet Stance on Warsaw Pact Foreign Policy Dispute," RLP, RL 173/84 (Apr. 30, 1984).

[74] Sharp attacks appeared in Pravda on July 27 and August 1, 1984; see the Boston Globe, July 29, 1984, and the New York Times, August 2, 1984.

[75] Moscow's ambivalence over the amnesty was reflected in the low-key play given to the 40th anniversary of Poland's communist regime in the Soviet press. While the speeches were duly reproduced in Pravda, "popular" journals such as New Times (no. 31, 1984) failed to mention the congratulatory telegram from the Soviet leadership in the July 22nd holiday; the annual feature article on Poland was also pointedly brief and terse, making no mention of the amnesty itself.

# U.S. INTERESTS, ISSUES, AND POLICIES IN EASTERN EUROPE

By Francis T. Miko*

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## SUMMARY

U.S. policy in Eastern Europe involves a difficult balancing of competing interests. U.S. policy is linked to and often subordinated to or constrained by U.S. domestic politics, superpower relations, and relations with allies.

The crisis in Poland has forced the Reagan administration to focus considerable attention on Eastern Europe in its first years. As the crisis has subsided, Administration attention has waned.

Despite heightened superpower tensions and a lingering crisis in Poland, relations with most of Eastern Europe do not seem to have deteriorated under the Reagan administration. With a few countries they may actually have improved.

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Differentiation based on the extent of autonomy from Moscow, signs of internal liberalization, and willingness to reciprocate remain the hallmarks of U.S. policy.

Commercial relations with Eastern Europe continue to be viewed by the administration more as a political lever than as a primary interest. But the decline in trade with Eastern Europe since the peak years of 1981 and 1982 seems to have been due more to economic constraints than to the East-West political atmosphere.

Congress continues to show a strong interest in Eastern Europe, reflecting ethnic constituencies and a traditional concern with human rights.

It remains to be seen how far the current U.S.-East European relationship, first established under the umbrella of U.S.-Soviet détente and in the framework of the Helsinki accords, can proceed in the shadow of continuing superpower conflict.

Official U.S. policy toward Eastern Europe is not without its critics. Several general policy alternatives have been suggested. Two approaches—strategic accommodation and strategic confrontation—are the opposite extremes of a policy that views Eastern Europe mainly in the context of superpower relations. Two other approaches—"local constructive engagement" and the opposite "local confrontation" attach primary significance to East Europe in its own right.

## INTRODUCTION

U.S. policy in Eastern Europe has been shaped by the need to carefully balance competing American interests and objectives. Dealing with the region has posed considerable challenge to successive administrations. U.S. policy has been criticized at times as vague and lacking in clear purpose. Alternately, the U.S. approach has been labeled as too adventurous, too timid, too cynical, or too naive. The seeming ambiguity in U.S. policy toward the region can be attributed at least in part to specific dilemmas facing policymakers:

First, there is no firm consensus on basic U.S. interests and objectives. The significance of Eastern Europe to U.S. interests, though demonstrable, is not widely understood.

Second, U.S. policy is inseparably linked to and often subordinated to (a) U.S. domestic politics, (b) relations with the Soviet Union, and (c) relations with its NATO allies. The various U.S. security, political, and commercial interests can be in conflict and are often difficult to reconcile.

Third, the U.S. faces serious constraints in the region. Bold moves in Eastern Europe to change the status quo, while tempting at times, carry high risks. Moscow perceives its interests in the region as vital and has repeatedly demonstrated its willingness to defend its position there. Yet Eastern Europe is also the region of greatest Soviet vulnerability, given Moscow's precarious and predominantly military hold over the region. By contrast it is an area in which the populace identifies its own aspirations with the West in general and the United States in particular. This gives the U.S. a special appeal and resulting influence but also imposes greater caution on U.S. policy-makers. It is the past responsiveness of Eastern Europeans to U.S. actions and rhetoric that dictates restraint.

Faced with these dilemmas, but in an atmosphere of sharply heightened U.S.-Soviet tensions, the Reagan administration, after some uncertainty, has settled into an East Europe policy remarkably consistent with that of its predecessor. Eastern Europe for the most part continues to occupy a secondary level of attention in U.S. policy when compared to some other regions.

The crisis in Poland forced the administration to devote more attention early to the area than it might otherwise have done. As the immediacy of that crisis has subsided, administration attention has waned. But a new crisis could again elevate U.S. interest.

Developments in Poland have profoundly affected previously friendly U.S. relations with that country—placing them at an all time low. But with the rest of Eastern Europe, the administration has been able to preserve or modestly improve relations despite Poland and U.S.-Soviet friction. Trade and commercial relations have stagnated with most countries, but the cause seems to be economic difficulties and constraints rather than administration policy.

The United States continues to differentiate in its relations with individual East European countries. The criteria on which it bases decisions of how to treat them appear to be largely the same as before. Ties with Romania and Hungary remain quite close, in recognition of different distinctive features of the policies of each. Relations with the GDR have improved slightly. Those with Bulgaria remain modest but there have been hints of Sofia's interest in moving forward. Relations with Prague continue to be quite strained.

Yugoslavia occupies a special place in U.S. policy and cannot be lumped with the rest of Eastern Europe. U.S. relations with this non-aligned country are on a different level. The United States continues to have virtually no relations at all with Albania, a tiny, poor, but strategically located country. Some have suggested that the United States should seek to improve relations with Tirana, though Albania has not been receptive to such overtures in the past.

In terms of the various instruments available to U.S. policy-makers in dealing wth Eastern Europe, there has been some shift in the relative priority given to different tools by the Reagan administration. Greater attention is devoted to ideological competition with the Soviet Union through international media and other activities. On the other hand the administration seems to continue to favor bilateral over multilateral approaches to the countries of the area. Commercial relations with Eastern Europe continue to be viewed officially as more of a lever than a primary U.S. interest in the region. This is reflected in policies on credits, export controls, trade preferences, etc.

Congress has traditionally demonstrated a strong interest in Eastern Europe, though it has been constrained by political and military realities. Congressional attitudes have been shaped by a desire to take advantage of Soviet vulnerabilities by ethnic constituencies, ideology, and a strong legislative interest in human rights. The role of Congress has been seen both in rhetoric and substance. The levers for congressional involvement have been trade and export control legislation, appropriations for international broadcasting and other activities related to Eastern Europe. In addition, the Congress has sought for itself a direct and ongoing role in the Helsinki process.

Looking ahead in U.S.-East European relations, a number of questions arise. Under current conditions, what policy toward Poland would best serve U.S. interests? How far can U.S.-East European relations progress in the current climate of U.S.-Soviet relations and as long as Poland remains a major source of tension? Can relations even at their present level be sustained without improvements in U.S.-Soviet relations? Until now relations with at least some of the East Europeans have proved quite durable despite the demise of detente.

## I. U.S. Interests in Eastern Europe

U.S. interests in Eastern Europe fall into two general categories, strategic—those related to the superpower rivalry and to the U.S. relationship with its key NATO allies—and those related directly to the region in its own right. The first include primarily allied security interests in the region as a potential asset or liability to Soviet strength and as a source of stability or instability in Europe. They can involve economic and other issues as they relate to these interests. The latter type of interests can include trade and economic opportunities, humanitarian considerations, and interests stemming from a sizable East European ethnic population in the United States. In recent history, there seems to have been a tendency for heightened superpower tensions to bring the strategic considerations to the fore while periods of U.S.-Soviet detente have allowed local interests to gain greater weight.

### HISTORICAL FACTORS

Historically, Central and Eastern Europe have been at the periphery of U.S. foreign policy interests. The countries of the region were significant to most Americans mainly as the place of origin of large numbers of immigrants. In the 1950s the overall emphasis of U.S. foreign policy was on containment of Soviet and Communist influence, particularly in Europe. During this period, the East European countries were viewed as Soviet satellites, and U.S. relations with the individual countries simply followed or were a reflection of U.S. relations with the Soviet Union. Only Yugoslavia, which broke away from the Soviet bloc in 1948, was given special treatment as the United States poured in aid to help Tito's government resist any Soviet efforts to bring the country back into Moscow's sphere.

A growing diversity among the East European countries emerged (in the aftermath of de-Stalinization and the worsening Sino-Soviet rift) in the late 1950s and early 1960s. U.S. Administrations began dealing with each country more independently in the hope of loosening East European ties to the Soviet Union. Another case was U.S. efforts to exploit Poland's conflict with Russia during the early years of the Gomulka regime. This "bridgebuilding" policy (so-named by President Lyndon Johnson) lost support after the

1968 Soviet invasion of Czechoslovakia where the policy had seemed to hold the most promise.

It was in the detente and "Ostpolitik" era of the the 1970s that relations between Eastern Europe and the West expanded rapidly in tandem with and under the umbrella of Soviet relations with the West. U.S.-East European relations under the Nixon and Ford Administrations expanded correspondingly but relations with the Soviet Union were given primacy. If there was any differentiation in policy, it was demonstrated only toward Romania, whose growing foreign policy independence, particularly its cooperative attitude on the Middle East, was appreciated. Relations were also good with Poland, and progress was being made in relations with other countries.

The Carter Administration established four priorities in its policy toward Eastern Europe: (a) Recognition and support for the individuality of each East European country in its approach to domestic and foreign policy; (b) treatment of each nation as a sovereign country while taking into account the political and geographic realities in the area; (c) improvement of relations through the expansion of human contacts, trade, institutional cooperation, and the freer flow of information; and (d) recognition of the limits of U.S. influence in the region and the need to pursue an East European policy in ways that contribute to the security of all Europe.[1]

In the economic sphere, the Carter administration spelled out two specific goals. These included: (a) improvement of economic relations and expansion of bilateral trade; and (b) engagement of Eastern Europe in the international economic system (including the Multilateral Trade Negotiations [MTN] and the North-South dialogue).[2]

The new features introduced by the Carter administration to U.S. policy were the emphasis on sovereignty and differentiation, based on domestic policies of individual East European countries, particularly their performance on human rights and family reunification problems. This policy led to improved relations with Hungary but also caused deterioration in relations with others, such as Czechoslovakia.

## FOREIGN POLICY AND SECURITY INTERESTS

U.S. security interests in Eastern Europe, though indirect, are substantial. As the buffer between the Soviet Union and Western Europe, these countries occupy a crucial strategic position. The region has significance in the context of both the superpower and U.S.-West European relationship. Over the years, the United States has recognized Soviet security interests in Eastern Europe and has exercised restraint in the region. But the United States has not accepted any exclusive Soviet interests or position there. At the same time the U.S. acknowledges and is sympathetic to strong traditional West European interests in Eastern Europe. Western Europe's own sense of security seems greater when Eastern Europe is engaged in an open and constructive relationship with the West.

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[1] U.S. Congress. House. Committee on International Relations. Subcommittee on Europe and the Middle East. "U.S. Policy Toward Eastern Europe." Hearings, 95th Cong., 2d Sess., Sept. 7 and 12, 1978. Washington, U.S. Govt. Print. Off., 1979. p. 35-39.

[2] Ibid.

As members of the Warsaw Pact, most of the countries, excluding Yugoslavia and Albania who are not members of the Warsaw Pact, contribute much to the numerical conventional strength of the Soviet Union. But given the history and the nature of the Soviet relationship with Eastern Europe, Soviet planners would have considerable uncertainty about their loyalty or performance in war.[3] Rather than enhancing Soviet confidence over its capabilities, Eastern Europe might even be a net deterrent to Soviet aggression in Europe due to doubts over its reliability. Western assessments of the NATO/Warsaw Pact balance would differ considerably based on different assumptions concerning the conduct of the national armed forces and populations in a war situation.

Additionally the region has been Europe's primary area of instability in the post-World War II period. This instability has been most costly to the Soviet Union. Because of Soviet vulnerabilities in the region, East Europe has been seen at times as a card to be played against Moscow.

However, playing that card in an aggressive fashion, as in the manner of the "liberation" or roll back policy of the early 1950s, can also carry potential costs for the West. Instability in Eastern Europe and the Soviet interventions that have often followed have brought suffering locally and have been seen as threatening the security of the entire European continent.

The current Soviet relationship with Eastern Europe, one based more on Soviet might than on shared perceptions of mutual interests, is viewed as likely to cause more tensions in the future, regardless of U.S. or Western policies. If for no other reason, Eastern Europe would be important to the United States because of the potential of developments there to trigger a larger European crisis. The United States shares with Western Europe an interest in not allowing the troubles in the area to spark a direct East-West confrontation.

The strategic interests of the U.S., as well as the critical security interests of the Soviet Union are centered in the Warsaw Pact's "northern tier" countries (the G.D.R., Poland, and Czechoslovakia) facing West Germany and the main forces of NATO. Despite this focus of interest, or maybe precisely because of it, opportunities for improved U.S. ties have presented themselves to a greater degree in some of the "southern tier" countries, namely Hungary and Romania. It may be that because Soviet security concerns are less extreme in the southern tier, those countries have somewhat greater flexibility in their conduct. It is in the southern part of the region that two other socialist countries, Yugoslavia and Albania, have left the Soviet orbit. The fact that U.S. ties are now closest with Yugoslavia, Romania, and Hungary may be less reflective of the direction of U.S. interests than of opportunity.

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[3] A number of specialists have sought to address the issue of Warsaw Pact reliability. For example, see Rakowska-Harmstone, Teresa, et al., "Warsaw Pact: The Question of Cohesion." Ottawa, Department of National Defense, December 1981. (Orae Extra-Mural Paper no. 19) For the most part, these assessments have concluded that while the question is a crucial one, it can not be answered with any confidence. They have generally concluded that East European behavior would vary and be scenario dependent.

The U.S. interest in Yugoslavia as a neutral buffer between the Warsaw Pact and the NATO southern flank is of a different order than the rest of Eastern Europe. Successive U.S. administrations have recognized no special Soviet security interests or influence in the country and have regularly pledged their support for Yugoslav neutrality. Administration spokesmen have stressed that "an independent, economically viable Yugoslavia capable of resisting external pressure is a factor for stability and peace in the Balkans, the Mediterranean, and Europe as a whole." [4]

### ECONOMIC AND COMMERCIAL INTERESTS

U.S. commercial interests in Eastern Europe are currently and likely to remain for the foreseeable future at a modest level. Yet the significance of trade policy to the overall U.S.-East European relationship is considerable. Trade is seen as a means of enhancing political relations and encouraging greater political and economic autonomy in individual countries. It is a potential alternative to overdependence on the Soviet Union. It is viewed by past and present administrations as the main lever of U.S. policy.[5]

Indeed economic relations with the U.S. do hold out greater potential from the East European perspective. Economic relations with the West have been seen by East European governments as a means of improving on poor agricultural and industrial performance through the import of technology and know-how. Hopes are clouded by the accumulating hard currency debt of East European countries, and other economic problems. It might be argued that Eastern Europe has been more responsive to economic leverage than has the Soviet Union. For instance, that the Polish government moved at least nominally to lift martial law in 1982 and released a number of political prisoners seemed designed to meet U.S. conditions for improved relations, in the hope of regaining trade benefits. Similarly Romania rescinded an emigration tax in 1983 following U.S. threats to withdraw MFN status if it did not cancel the tax.

There are indications of new administration emphasis on conditionality in dealings with Eastern Europe. As Vice President Bush explained:

> . . . Over the span of many years the United States has provided hundreds of millions of dollars of loans and credits for the Polish economy in the hope that this aid would help build a more plentiful and open society. We cannot, however, be expected to shore up a nation's economy when the government refuses to institute the most basic economic reforms. If countries insist on following the Soviet economic model, even dollars, francs and marks cannot prevent the certain failure of their economies.
>
> It is by now abundantly clear that highly centralized, command economies cannot fulfill the basic needs of their populations, let alone remain competitive in world markets or keep pace with technological advancement. Just as retarded industrial development relegated much of nineteenth century Central Europe to a backwater of agricultural poverty, there is ample evidence that the unfolding information revolution will sweep past an unprepared Soviet Union and much of Eastern Europe—unless there is basic change. For example, Hungary's relative prosperity demon-

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[4] Lawrence Eagleburger, "U.S. Policy Toward the U.S.S.R., Eastern Europe, and Yugoslavia," U.S. Department of State Current Policy Paper, No. 284, p. 5.

[5] A broad discussion of the assumptions underlying U.S. economic relations with the East is provided in: U.S. Congress. Senate. Committee on Foreign Relations. "The Premises of East-West Commercial Relations." A workshop. Washington, U.S. Govt. Print. Off., 1983. 196 p.

strates the practical, positive results that follow on social and economic liberalization.[6]

This is not to say that the U.S. does not have economic interests of its own in Eastern Europe. The region represents a limited but relatively untapped market for U.S. products, particularly in the areas of agriculture and technology. Between 1970 and 1980, U.S.-East European trade rose eight-fold. The U.S. enjoyed a sizable positive trade balance. Trade declined substantially in 1982 as a result of East European curbs on imports.[7] In particular, U.S. agricultural and technology exports have found a market in Eastern Europe. According to some analysts, even the transfer of technology—while lopsided in the direction of West to East—may not be entirely a oneway street. Some have suggested that there may be areas where the U.S. could benefit from Eastern technology.[8]

The United States has far more limited economic relations with Eastern Europe than do many of the Western industrialized nations, especially West Germany.[9] While U.S. commercial interests in expanded trade are reciprocated by the East European countries, the potential for growth is presently limited by U.S. trade restrictions against some countries, as well as by growing East European trade deficits and hard currency debt. Together, these factors have in many cases led to sharp reductions in imports from the West. Even if trade were again expanded, the East European countries would remain modest U.S. trading partners. Yugoslavia, Romania, and Hungary are the main focus of current U.S. economic interest, although the advanced economies of the G.D.R. and Czechoslovakia may have substantial future trade potential.

## HUMANITARIAN INTERESTS

A third category of U.S. interests in Eastern Europe concerns human rights. While the Soviet and East European governments have often portrayed the Western stand on this issue as just one more weapon seized upon to undermine their systems, this element of U.S. policy seems more idealistic than calculated, reflecting more the Wilsonian principles of democracy and self-determination than "realpolitik." U.S. human rights policy stops well short of challenging Soviet or Communist rule. But East European aspirations for greater individual freedom and national self-determination have struck a responsive chord among Americans.

This interest was brought to the fore in the Conference on Security and Cooperation in Europe where under strong Western pressure principles of human rights and freer contacts were embodied in the 1975 Helsinki Final Act. Under the Carter administration, the issue received concentrated attention in the context of its global human rights policy. Human rights in Eastern Europe continues to receive support under the Reagan administration, as demonstrated by the U.S. posture at the Madrid CSCE follow-up meeting which ended in September 1983.[10]

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[6] Address by George Bush, Vice President of the United States, Vienna, Austria, Sept. 21, 1983. Press release from the Office of the Vice President, Sept. 21, 1983.

[7] U.S. Department of Commerce. Highlights of U.S. Foreign Trade.

[8] See John W. Kiser. Tapping Eastern Bloc Technology. Harvard Business Review, v. 60, March/April 1982: 85-93.

[9] See U.S. Department of State. Bureau of Intelligence and Research. "Trade of NATO Countries With European CEMA Countries, 1979-82." (Report 726-AR) Nov. 28, 1982: 18, 19.

### DOMESTIC POLITICAL CONSIDERATIONS

Official U.S. interest in Eastern Europe has a strong domestic political component. Over fifteen million Americans claiming East European origin form a constituency on East European issues, though their influence is diminished by the fact that they do not speak with one voice and by the existence of other competing, and sometimes nullifying, interests in the American political process.[11] Polish-Americans make up the largest share of this total, but significant numbers have emigrated to the United States from the other countries. Their efforts have concentrated on building up political pressure for policies in Eastern Europe which give higher priority to the interests of the people in the region. Intense rivalry between the two parties for East European ethnic votes in both presidential and congressional elections has placed Eastern Europe on the campaign platforms of both parties in presidential and congressional elections—not always in a manner helpful to the conduct of a consistant U.S. policy. For example exaggerated promises, particularly those of "rolling-back Communism" and "liberation" of Eastern Europe in the early 1950s created misconceptions at home and abroad while having little relationship to actual policy.

## II. ISSUES IN U.S.-EAST EUROPEAN RELATIONS

### POLITICAL ISSUES

The United States has normal diplomatic relations with all of the countries of Eastern Europe except Albania. In the case of Poland, an exchange of new ambassadors has been delayed by Poland's refusal to accept the credentials of Ambassador-designate John Scanlan, presumably until relations are improved and sanctions lifted. This action is illustrative of the level of tension between the two governments since Poland's declaration of martial law in December 1981. The United States has viewed with concern the very hostile anti-American rhetoric voiced by some East European countries in their media and in various international arenas. Czechoslovakia has been singled out by U.S. officials in this regard. It is one of the main issues pointed to by the U.S. side as hindering a normalization of relations.

East European actions in the international sphere have in some cases been a sore point in bilateral relations. U.S. policy is not to hold East European governments accountable for Soviet activities abroad, even when they are supportive of Moscow. But the United States has been critical of direct East European support for Soviet involvement in the Third World. The GDR and Bulgaria have been viewed as particularly active in training, arming, and providing technical support to "national liberation movements" and radical governments.[12] Regarding allegations of Bulgarian complicity in the assassination attempt against Pope John Paul II and other acts of terrorism, the administration has withheld any judgment for the public record, deferring to the Italian judicial investigation which is still going on.

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[10] For a discussion of U.S. policy and the outcome of the Madrid CSCE meeting, see: "CSCE Follow-up Meeting Concludes in Madrid," September 1983. U.S. Dept. of State Bulletin Reprint, October 1983; and

"The Madrid CSCE Review Meeting," Compiled and Edited by the staff of the Commission on Security and Cooperation in Europe. Washington, D.C., November 1983. 103 p.

[11] See Garrett, Stephen. "Eastern European Ethnic Groups and American Foreign Policy." Political Science Quarterly, v. 93, no. 2, summer 1978: 301-323.

Claims settlements have now been reached with all East European countries except the GDR. The United States is also supporting the resolution of Jewish claims against the GDR. Adjudication of American claims was completed on the U.S. side in 1981, according to the Department of Commerce. The United States is seeking a lump sum settlement of $78 million plus 6 percent interest. The East Germans want to settle on a case-by-case basis. Talks were held most recently in June 1983, but they were inconclusive.

The issue of Berlin has not been a source of serious problems in East-West relations since the signing of the quadripartite agreement in 1971. But the Western allies have expressed concern over East German efforts to erode the special status of the entire city, at least in the public eye. The GDR publicly has taken the position that East Berlin is the capital and an integral part of East Germany and that only West Berlin has special status. According to the four-power agreements, all of Berlin has the same special status. On the official level, the Soviets and East Germans have continued to respect the rights of the other allied powers in East Berlin.

### POLAND: MILITARY CRACK-DOWN AND U.S. SANCTIONS

U.S. policy toward Poland in 1980 was to do what it could to dissuade the Polish government from tightening controls, and the Soviet Union from intervening. There were unspecific offers of stepped up aid to Poland in the event of forebearance of Polish and Soviet authorities.

When the Jaruzelski government imposed martial law in December 1981, the United States took a harsh view of the action. President Reagan announced a series of specific sanctions against Poland. These included: (1) suspension of Export-Import Bank credit insurance; (2) suspension of Polish fishing rights in U.S. waters; (3) tighter restrictions on high technology exports to Poland; and (4) suspension of Polish civil aviation rights. In 1982, the United States suspended Poland's MFN status.[13] That tough U.S. response was based on rejection of Polish claims that: (a) the action was in response to overzealousness by Solidarity; (b) that the Soviets were not involved; (c) that Polish leaders acted out of national considerations; and (d) that this was strictly a Polish internal affair.[14]

The administration moved to ease some of the restrictions in the fall of 1983, citing the improvement of church-state relations with the Pope's visit and the release of many political prisoners. It is noteworthy that the Administration did not give as a reason the formal lifting of martial law in July 1983 because that was not interpreted as more than a cosmetic action. Specifically, the administration agreed to join in renegotiation of Poland's $11 billion dollar hard-currency government debts (of which some $2 billion is owed the U.S. Government) and announced that Poland would be allowed to negotiate new fishing rights.[15]

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[12] A number of articles and studies have been written on the East German role in the Third World. See for example: Butler, Sherman R., and Jiri Valenta. "East Germany and the Third World." U.S. Naval Institute Proceedings, v. I, September 1981: 58-64; and Plate, Bernard von. "GDR Foreign Policy to Africa and Arabia." Aussenpolitik, v. 29, no. 1, 1978: 75-101.

[13] President Reagan's Christmas Address to the Nation, December 23, 1981. U.S. Department of State. Current Policy no. 357, Dec. 23, 1981: 2.

[14] Poland and the Future of Europe. Speech by Secretary of State Alexander Haig in Brussels, January 12, 1982. U.S. Department of State Current Policy no. 362, Jan. 12, 1982: 2.

## CSCE COMPLIANCE ISSUES [16]

### *Human rights*

The Conference on Security and Cooperation in Europe played a key role in establishing guidelines for U.S. relations with Eastern Europe, particularly in the area of human rights. "Basket One" of the Final Act, signed in 1975, established a voluntary code of conduct which was acceded to by all participants. Human rights remains a primary issue affecting U.S.-East European relations. None of the East European countries are seen as having a fully satisfactory record. Each is a single party state where the Communist Party has unchallenged authority. Each to some extent abridges what are viewed as fundamental human rights in the West. Nevertheless, there is considerable variance in how far individual governments have gone to implement CSCE.

Yugoslavia has generally been seen as having a better human rights record than other East European countries. In any case, its record has not been given public official U.S. scrutiny, as have those of other East European countries. Czechoslovakia, Romania, and the GDR were accused in the most recent official U.S. assessments of dealing very harshly with their active dissident movements. In the Romanian case, there has also been concern expressed over the poor treatment of the very large Hungarian minority. Bulgaria, though seen as working to improve its image, does not have a significant dissident movement. But dissidence is not tolerated by the Sofia authorities either. The Polish human rights picture has generally improved since the formal lifting of martial law. Even under martial law, Polish authorities were seen as less repressive than those of several countries. Hungary is generally seen as having a better human rights record, although there have been stepped up efforts by authorities recently to control various dissident groups and the spread of *Samizdat* literature. Overall, Hungarian domestic policies are still viewed as relatively tolerant.

### *Human contacts ("Basket Three")*

The record of various countries with regard to movement across borders, including emigration and family visits continues to be a serious bone of contention in U.S.-East European relations. The

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[15] See the New York Times, Nov. 1, 1983: 1.

[16] The information in this section comes primarily from two sources: "Fourteenth Semiannual Report by the President to the Commission on Security and Cooperation in Europe on the Implementation of the Helsinki Final Act, Dec. 1, 1982," May 31, 1983. U.S. Department of State Special Report No. 109: 30; and U.S. Commission on Security and Cooperation in Europe. "Implementation of the Final Act of the Conference on Security and Cooperation in Europe: Findings and Recommendations Seven Years After Helsinki." Washington, U.S. Govt. Print. Off., 1982. 258 p.

CSCE Final Act establishes principles with regard to family reunification and visits. The U.S. State Department intervenes regularly on behalf of individuals seeking reunification with families. The following table shows the number of pending cases.

### DIVIDED-FAMILY CASES [1]

| | Nuclear families [2] | | Nonnuclear families [3] | |
|---|---|---|---|---|
| | Cases | Individuals | Cases | Individuals |
| Bulgaria | 11 | 20 | 10 | 27 |
| Czechoslovakia | 2 | 2 | 3 | 12 |
| G.D.R | 0 | 0 | 9 | 29 |
| Hungary | 0 | 0 | 0 | 0 |
| Poland | 160 | 332 | 232 | 734 |
| Romania | 44 | 76 | 496 | 967 |
| U.S.S.R | 71 | [4] 265 | | |

[1] "Fifteenth Semiannual Report of the President to the Commission on Security and Cooperation in Europe on the Implementation of the Helsinki Final Act, June 1, 1983–Nov. 30, 1983." U.S. Dept. of State Special Report No. 113, p. 23.

[2] Spouses and their minor children.

[3] These cases involve the separation of other relatives such as brothers and sisters.

[4] Figures for the U.S.S.R. include both nuclear and nonnuclear families.

Yugoslavia allows families free movement across its border, so that implementation of "Basket Three" has not been viewed as an issue. Hungary has been generally forthcoming on family reunification cases with the United States. The record of other countries has been viewed as more negative. Travel to the West is restricted to varying degrees by all the countries, except perhaps Yugoslavia. It is relatively easy for Hungarians and Poles to go abroad, more difficult for others, and virtually impossible for most East Germans. Americans have few problems traveling to Eastern Europe, although Czechoslavakian authorities make it very difficult for former nationals to visit that country.

### *Economic cooperation ("Basket II")*

Yugoslavia, Hungary and Poland are viewed as having relatively good records with regard to facilitating economic cooperation with the West, providing economic and foreign trade information, and allowing access by Western businessmen to officials and end-users. The Romanian and East German records are more mixed. Both favor economic cooperation but have been less forthcoming with macro-economic and foreign trade figures. Czechoslovakia and Bulgaria are seen as having a poor record with regard to both working conditions for businessmen and the provision of adequate information for necessary risk assessment.

## COMMERCIAL ISSUES [17]

### *Normalization of trade relations*

The United States has signed trade agreements with Yugoslavia, Poland, Romania, and Hungary. Romania and Hungary receive most-favored-nation status and access to government-backed credits on the basis of a waiver of the Jackson-Vanik Amendment to the

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[17] The primary sources for this section are unclassified briefing materials of the U.S. Department of Commerce.

Trade Act of 1974 (linking MFN and credits to emigration policies). The waivers have to be renewed annually by the President and Congress. Both countries have pushed for multi-year waivers, claiming that such a move would take away some of the uncertainty and allow for planning in economic relations with the United States. Yugoslavia and Poland already had MFN status when the legislation was passed in 1974, so they are not subject to the annual waiver process. Poland's preferential trade status has been suspended since 1982.

All of the other East European countries have expressed interest in improving trade relations with the United States. Thus far they have not been willing to accept the terms of the Jackson-Vanik amendment. The current Czechoslovak government is most resistant to a major opening in trade relations with the West.

### *Trade levels*

U.S. trade turnover with all the East European countries has declined since the peak reached in 1980 or 1981. The decline has been largely tied to import restriction policies of the East European governments in an effort to improve their trade balances and to reduce their hard currency debt. The decline is also a consequence of the failure of most countries to increase exports to the West by hoped for amounts.

Not surprisingly, trade levels are most improved with the countries that have MFN, although in the case of Hungary there has been disappointment with the very modest levels of trade despite preferential treatment. The trade relationship with the GDR has been characterized as the least developed of any with Eastern Europe. This is due in large part to the GDR's heavy emphasis on economic ties to the Federal Republic. In the past, U.S. trade figures have been skewed by the fact that the United States does not include goods transshipped through the FRG or other third countries.

In some cases, trade has also been hindered by U.S. import restrictions aimed at curbing alleged East European dumping on the U.S. market. The Monlan Wax case involving the GDR and the recently resolved Romanian carbon steel plate case are recent illustrative cases. Romania has also been affected by U.S. limits on textile imports.

U.S.-East European trade has been affected by tightened controls on U.S. high technology exports. Most of the countries have expressed interest in easier access to advanced technology.

### *Debt*

The rapid rise in the East European hard currency debt has been a source of concern for all of the Western creditors. Debt rescheduling has been necessary in the case of Romania and Poland, with which negotiations are now underway. The GDR has an estimated $13 billion hard currency debt and a 50 percent debt-service ratio but has not missed any payments on its debt. Hungary, with a medium term debt of $6 billion and short-term debt of $1.8 billion, has one of the highest per capita burdens. Thus far the country has been viewed as benefiting from sound financial and debt management. Its 1983 credit piciture has been improved by $600 million standby and commodity compensation credit from the IMF and $240 million in World Bank loans.

### POLICY CHOICES

The U.S. policy toward Eastern Europe over the past several years is not without its critics. Various alternatives have been proposed at different times. Within a broad range of proposed policies, four basic approaches toward Eastern Europe can be identified. Two very divergent approaches essentially subordinate the region to the requirements of the superpower relationship. One can be labeled *strategic accommodation* and the other *strategic confrontation.* Two other distinct approaches have in common that they place emphasis on Eastern Europe's significance in its own right. These might be termed *local constructive engagement* and *local confrontation.* This local emphasis of one type or the other is likely to be embraced by Americans of East European origin who still feel affinity for their country of origin. there is bound to be overlap among at least some of these approaches. Actual policy is not likely to fit neatly into any one approach.

*Strategic accommodation* involves subordinating relations with Eastern Europe to those with the Soviet Union in order to enhance superpower harmony. This approach, suggested by the so-called "Sonnenfeldt Doctrine," implies treating countries of the region more even-handedly than in the past, without regard for differences in their domestic or foreign policies. It accepts the region as being within the Soviet sphere of influence. Proponents of this approach feel that the modest U.S. interest in Eastern Europe does not justify actions in the region that might adversely affect relations with the Soviet Union. They believe that attempts to deal selectively with the countries of Eastern Europe will be seen by the Soviets as attempts to undermine their own position there. Advocates of this approach favor strict non-interference in the internal affairs of the individual countries and in East European regional affairs. They favor a multilateral approach to East-West negotiations and across-the-board efforts to improve relations with the East. Some proponents would apply this policy even to non-aligned Yugoslavia with the rationale that it is a Communist country in which the Soviet Union has greater interests than does the United States. Others would exclude Yugoslavia from this approach on the basis that it is outside the Soviet sphere.

*Strategic confrontation* implies a policy of aggressive differentiation toward Eastern Europe with the primary purpose of driving a wedge between the Soviet Union and its Warsaw Pact allies. The importance of the region is seen mostly in terms of the superpower balance. Proponents emphasize differences between the Soviet Union and East European countries and favor exploiting Soviet vulnerabilities in the region with the aim of weakening the Soviet Union.

This group sees a degree of unrest, instability, and tension in the area as serving the security interests of the United States. The ultimate consequences of the policy for East European countries, themselves, are of secondary interest. Even if this policy were to trigger a Soviet backlash and bring East Europe under tighter Soviet control in the short run, this would be viewed as an acceptable price because it would be likely of building up pressures in the long run.

*Local constructive engagement* involves a more subtle differentiated policy toward individual countries aimed at encouraging internal liberalization, a commitment to East-West interdependence in Eastern Europe and ultimately greater political, economic, and foreign policy independence from the Soviet Union. This approach is fueled not so much by a desire to weaken the Soviets as it is by the aim of meeting the aspirations of East Europeans for greater national autonomy and individual liberty, while maintaining stability in Europe. It assumes that meaningful reform is possible within the confines of the present system and despite the dominant role of the Soviet Union.

Carrots and sticks are used to pressure East European governments toward social and economic reform. Taking into account the diversity that exists in the region, it suggests preferential treatment to countries that act more independently of the Soviet Union in domestic and foreign policies in ways that coincide with U.S. interests—security, economic, or humanitarian—and popular aspirations. Proponents support cautious attempts at loosening Soviet-East European bonds but only to the extent that these do not risk confrontation with the Soviet Union. They believe that the United States is justified both morally and by virtue of its self-interest to encourage diversity in the region. Ideally this policy would eventually lead to a "Finlandization" of Eastern Europe—a situation in which each country would have the fullest autonomy to develop in its own way internally at the price of some concession of sovereignty to Soviet security requirements.

*Local confrontation* takes an uncompromising position aimed at weakening all the Communist governments of Eastern Europe. Proponents of this approach are generally unimpressed with the extent of diversity that exists within what they still view as a Soviet-dominated bloc. They argue that the similarities among the governments outweigh by far the differences. They suggest that the economic and political changes that have been introduced are modest and tactical in nature.

Proponents of this approach are concerned that the Soviet Union might try to gain through individual East European countries the concessions from the West that it cannot get on its own. As long as the Soviet Union continues to dominate the region, they recommend dealing with East European governments, with the exception of Yugoslavia (or according to some—including Yugoslavia) essentially as proxies of the Soviet Union. They view the present systems under present leadership as unreformable. They argue that the East European governments have no credibility with the populations as a whole and that the people of Eastern Europe resent Western policies that confer legitimacy on their unwanted leaders. Accordingly the United States is urged to take a principled position in support of the people against their governments.

## III. Policy of the Reagan Administration

The main regional issue demanding the Reagan administration's attention in Eastern Europe has been the crisis in Poland. There is some indication that prior to the emergence of that issue, the inclination of the administration was to take a hard approach toward all the Warsaw Pact regimes. It may have been developments in Poland, particularly the rise of Solidarity, that finally convinced the administration to take a more varied approach.[18]

Administration policy on Poland went through two phases. During the Polish "renewal" period it supported the liberalization process led by Solidarity. The U.S. sought to encourage the Polish authorities to accept reforms with vague offers of major assistance in return for enlightened policies. Meanwhile, the administration pressed the Soviets to exercise restraint and to avoid direct intervention. The declaration of martial law by the Polish government in December 1981 introduced a new phase in Soviet policy. The President imposed tough sanctions on Poland and the Soviet Union in response to martial law. The administration took the position that the Polish government crack-down against Solidarity and reneging on reforms was imposed by the Soviet Union in violation of Polish sovereignty.

There have been some modest gestures by the administration suggesting that U.S. policy may be entering a third phase in the aftermath of the formal lifting of martial law by the Polish government. At the time of this writing, it is not clear how far the U.S. will go to ease sanctions and normalize relations with Poland. For the moment, at least, relations remain at a low point.

But the Administration's tough line toward the government of Poland and toward the Soviet Union on the issue of Poland has had little visible spill-over effect onto relations with other East European countries where policy—in deed if not in word—has been a continuation of policies in place. The strong anti-Communist rhetoric of the Reagan administration, may to some extent have obscured this fact. It is noteworthy that crises in Afghanistan and Poland—the two events with the greatest impact on U.S.-Soviet relations—have had little impact on ties with most Eastern European countries.

While this fact may reflect a conscious effort by the administration to shield its relations with Eastern Europe from the adverse effects of outside events, it also reflects a similar determination by some East European governments to pursue their own detente with the West regardless of the state of superpower relations. Of equal importance, Moscow does not seem to have placed strong, or at least effective, pressure on East Europe to curb its ties with the West. Seeming Soviet forebearance could have several explanations. It could indicate that East European ties with the West are seen as serving Moscow's own interests by lessening the economic burden in the region and by maintaining access to the West through proxies at a time when direct Soviet limits—and this notwithstanding the risks of deepening Western involvement in East Europe—are reduced. On the other hand, it may be a symptom of Moscow's deteriorating position and lowered expectations in the region. The Soviets may now be willing to settle for less in Eastern

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[18] See Robert Rand. "Differentiation Remains Basis of U.S. Policy Towards Eastern Europe," Radio Liberty Research, No. 165-83, Apr. 25, 1983: 2.

Europe, or at least allow greater maneuvering room—so long as instability is prevented and the basic system is not challenged.

### OFFICIAL POLICY STATEMENTS

There are few broad policy statements from the Reagan Administration concerning Eastern Europe. Most official comments are directly related to events in Poland—a special case. Some light on the Reagan approach has been shed by administration witnesses at congressional hearings.

A strong pledge to continuity was placed on the public record by Lawrence Eagleburger, then Assistant Secretary for European Affairs, in 1982. Testifying before the House Subcommittee on Europe and the Middle East, he indicated that consistency needed to be an essential element of policy, adding:

> With regard to Eastern Europe and the Soviet Union, I think that is the particularly important and primary task, that we have to establish in the minds of the leadership that the United States is intent on pursuing certain objectives, that will be steady in those objectives, and that indeed the Soviets will have to count on the fact that we have those objectives in mind in dealing with them.[19]

But a sharpened rhetoric and intent to participate more actively in the ideological struggle with the Communist world was underlined by President Reagan during his visit to Europe in the spring of 1982. Speaking in London, President Reagan expressed his commitments to an international campaign for democracy, responding to the Soviet belief that the competition of ideas and systems must continue. The President said:

> While we must be cautious about forcing the pace of change [in the Communist countries] we must not hesitate to declare our ultimate objectives and to take concrete actions to move toward them. . . .
>
> The objective I propose is quite simple to state: to foster the infrastructure of democracy—the system of a free press, union, political parties, universities—which allows a people to choose their own way . . .[20]

A few months later, Secretary of State George Shultz was quoted in The New York Times to the effect that recent developments in Communist countries suggest "that a new age of democratic revolution and reform lies ahead of us." While pledging that the United States would not foment violent unrest, he reportedly said that "It is our responsibility, both moral and strategic, to meet their calls for help. . . ." We must aid their struggle for freedom.[21]

The most comprehensive statement of the Reagan administration on its East European policy was delivered by Vice President George Bush in Vienna on his return from a trip to Romania and Hungary in September 1983. In that speech he stressed America's "strong and unbreakable ties with the people of Central Europe." He strongly rejected the notion that either the Yalta Conference or the Helsinki accords were an agreement to divide Europe. He characterized U.S. objectives and policy in the following manner:

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[19] U.S. Congress. House. Committee on Foreign Affairs. Subcommittee on Europe and the Middle East. "Developments in Europe, February 1982." Hearings . . ., 97th Congress, 2nd session, Feb. 9, 1982. Washington, U.S. Govt. Print. Off., 1982. p. 2.

This statement was preceded in Mr. Eagleburger's opening remarks by his assessment that it was necessary to reassure U.S. allies that "we have a steady foreign policy, that we do not shift from time to time or day to day or administration to administration . . .

[20] President Reagan's address, London, June 8, 1982. Dept. of State Bulletin, v. 82, July 1982: 27-28.

[21] Bernard Gwertzman. "Shultz Foresees Revolution for Communists." The New York Times, Oct. 19, 1982, p. A2.

> Let me stress here that the United States does not seek to destabilize or undermine any government, but our attitude toward the region is informed by a sense of history—of European history. For this reason we support and will encourage all movement toward the social, humanitarian and democratic ideals which have characterized the historical development of Europe. We appreciate the special role of countries such as Yugoslavia and Austria which have contributed so much to restoring historic patterns of trade and communications.
>
> We share with the people of Eastern and Central Europe three basic aspirations; freedom, prosperity, and peace. We recognize the diversity and the complexity of the region. Of Austria's neighbors to the East, some have shown a greater measure of independence in the conduct of their foreign policy. Some have introduced greater openness in their societies, lowered barriers to human contacts, and engaged in market-oriented economic reforms. Others, unfortunately, continue to toe the Soviet line. Their foreign policy is determined in Moscow, and their domestic policies still flagrantly violate the most fundamental human rights.
>
> In our relations with the countries of Eastern Europe, we take these differences into account. . . .
>
> . . . Let me stress once more that our hopes for Eastern Europe are peaceful. But we believe that reform is essential. . . .
>
> The countries of Eastern Europe have a choice to make. They can close themselves off, or they can open up and join the world economy positively, as traders rather than debtors. Think about this: 25 percent of all Soviet farm output comes from private plots that occupy less than 3 percent of the Soviet Union's agricultural land. It's doubtful whether Soviet agriculture could survive without this concession to private enterprise.
>
> Freedom is the essential component of progress—the freedom of each individual to bring his knowledge and wisdom to bear on the economic decisions that will directly affect his life. This requires freedom of information, the free flow of ideas and the free movement of people. We take these freedoms to be fundamental, moral precepts; but they are also practical necessities. If a society revises history to suit ideological needs; if it censors information; if it punishes imaginative and creative individuals and discourages initiative in its people—that society condemns itself to ignorance and backwardness and poverty.[22]

In another earlier policy statement on Eastern Europe, then Assistant Secretary for European Affairs Lawrence Eagleburger outlined U.S. policy in testimony before the House Subcommittee on Europe and the Middle East. His description of key elements of policy is very much in line with the speech by the Vice President.[23]

### SPECIFIC FEATURES OF POLICY

The policy, as stated, includes: (1) recognition of no lawful division of Europe, (2) recognition of the diversity of the region, and (3) encouragement of peaceful social and economic evolution. The basic thrust of present U.S. policy is to encourage greater autonomy by all the East European countries from the Soviet Union, ideally by distancing themselves from Moscow in foreign policy generally but at least in terms refraining from direct participation in Soviet actions abroad viewed as inimical to U.S. interests. The official goal continues to be for evolutionary rather than revolutionary change.

As stressed by administration spokesmen, U.S. policy is to treat East European countries individually. The current emphasis on this point is great. According to Lawrence Eagleburger, "Nothing could serve our interests in that part of the world worse than to lump them into one bloc. Each nation represents unique problems and unique opportunities for the United States." [24]

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[22] Vice President Bush, op. cit.

[23] Lawrence Eagleburger, op. cit.

This statement was presented at a hearing before the Subcommittee on Europe and the Middle East of the House Foreign Affairs Committee on June 10, 1983.

The criteria for differentiation seem to remain, as under President Carter, the extent of foreign policy independence from Moscow and the degree to which the governments foster domestic political and economic liberalization and human rights.

> Our policy is one of differentiation—that is, we look to what degree countries pursue autonomous foreign policies, independent of Moscow's direction; and to what degree they foster domestic liberalization—politically, economically and in the respect for human rights. The United States will engage in closer political, economic and cultural relations with those countries such as Hungary and Romania which assert greater openness or independence. We will strengthen our dialogue and cooperation with such countries.[25]

Specific conditions set by the Reagan administration for improving relations include:

> Evidence of reciprocity. Individual countries must have the desire and ability to reciprocate in our relations and show sensitivity to U.S. interests.
>
> Indications of a constructive policy in Europe, through the CSCE process and in bilateral relations with other European countries. (This selective application of a code of conduct to Europe seems to imply a willingness to ignore East European rhetorical positions on problems in other regions even if they diverge from U.S. interests.)
>
> Indications that individual governments are sensitive to the traditions and aspirations of their people (as opposed to being mere instruments of Soviet policy).
>
> Willingness by governments to fulfill their obligations under human rights, economic, and other provisions of the CSCE Final Act.[26]

It is basically left to East European countries to set the pace for bilateral relations in view of the fact that they are viewed as best knowing the constraints under which they must operate.

U.S. policy continues to recognize Yugoslavia as holding a special place in its relations with East European countries. Based on Belgrade's nonalignment, its less rigid internal policies, and its commitment to "market socialism," the United States treats Yugoslavia distinctly from the rest of Eastern Europe. The administration attaches special importance to Yugoslavia and views relations as being qualitatively different from those with Warsaw Pact countries.[27]

The differentiation policy was underlined by the Bush visit to Eastern Europe in 1983. The countries he visited (Yugoslavia, Romania and Hungary) were those which were viewed as coming closest to meeting at least some of the criteria. He praised the unspecified "more imaginative leaders" in some of these countries who have "listened to the just wishes of their people" and instituted social and economic reforms. He noted, specifically, that Hungary's relative prosperity demonstrated the "practical and positive results that follow on social and economic liberalization." In the case of Romania, his visit recognized the Ceausescu leadership's relative autonomy in foreign policy. This autonomy was again demonstrated by Romania's stance on the issue of intermediate nuclear weapons. Ceausescu, while criticizing the U.S. deployments of intermediate range nuclear missiles (INF) in Western Europe, also berated the Soviets for walking out of the talks and threatening counterdeployments.[28] It was also apparent in Bucharest's recent posture at CMEA and Warsaw Pact meetings, where it again opposed efforts toward tighter bloc integration.

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[24] Ibid., p. 1.
[25] Vice President Bush, op. cit.
[26] Eagleburger, op. cit., p. 4.
[27] Ibid., p. 1.

U.S. differentiation policies have apparently not required that favored governments meet all the criteria. Hungary adheres closely to Moscow's line on foreign policy, though its own role abroad in support of Soviet policies is modest. Romania in turn continues to maintain tight internal controls and highly restictive social and economic policies. It is frequently cited as a major violator of human rights. The favored position granted to some East European countries has not meant that the Reagan administration would refrain from criticism or even sharper responses when those governments took actions viewed as inimical to U.S. interests. Thus, for instance, the Administration threatened in 1983 not to renew Romania's most-favored-nation status if it did not rescind an emigration tax seen as running counter to the bilateral trade agreement.[29]

Current U.S. policy includes limiting ties with certain other East European countries. During and after his visit, Vice President Bush stressed that the U.S. would not reward closed societies and belligerent foreign policies. He cited Bulgaria and Czechoslovakia as "flagrant violators of the most fundamental human rights." The most recent Presidential semiannual report to the U.S. Helsinki Commission agrees with this negative assessment, as does the Commission's own report on the CSCE Final Act.[30]

The German Democratic Republic and Bulgaria were singled out in Vice President Bush's Vienna speech for performing as Soviet proxies in the training, funding, and arming of terrorists and for their military and technical assistance to movements seeking to destabilize governments in the developing world.[31] East Germany, along with Cuba, has in recent years stepped up its role in Africa and other parts of the Third World, in particular providing technical assistance in setting up security forces and government media systems for Soviet client governments and "national liberation movements." Bulgaria has been implicated in supporting various terrorist acts and assassination plots and according to some reports has replaced Czechoslovakia as a major training ground and safe haven for international terrorists.

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[28] Speech by Romanian President Nicolae Ceausescu to the Grand National Assembly, Nov. 23, 1983. FBIS.

[29] "Fourteenth Semiannual Report by the President to the Commission on Security and Cooperation in Europe on the Implementation of the Helsinki Final Act, Dec. 1, 1982," May 31, 1983. U.S. Department of State Special Report No. 109.

[30] U.S. Commission on Security and Cooperation in Europe. "Implementation of the Final Act of the Conference on Security and Cooperation in Europe: Findings and Recommendations Seven Years After Helsinki." Washington, U.S. Govt. Print. Off., 1982. 258 p.

[31] For a recent summary of the East European role in the Third World, see U.S. Department of State. "Soviet and East European Aid to the Third World, 1981." Washington, D.C. February 1983. 23 p.

The Administration's East Europe policy also includes support for individuals and groups such as Solidarity in Poland and the "Charter 77" movement in Czechoslovakia which seek to bring social and economic reform.

### TRADE AND ECONOMIC COOPERATION AS INSTRUMENTS OF U.S. POLICY

The Reagan Administration views trade and economic relations as primary tools of policy toward Eastern Europe. But even within the administration, there seem to be differences over how to use this instrument, going beyond Eastern Europe to the question of how U.S. policy affects the Soviet Union. Is the United States best served by a forthcoming economic relationship which might serve to increase East European well-being and autonomy but might ease the economic burden of empire borne by the Soviet Union? Or, alternately, is the United States better served by a policy of denial which may heighten economic and social tensions in the region and maximize costs to Moscow?

Economic policy has been used as the main form of differentiation and leverage on East European governments. For instance, in the early stages of the Polish crisis, the prospect of debt rescheduling and economic assistance were held out as carrots to induce the government to stay the course of social and economic reform. With the imposition of martial law the administration resorted to the "stick" of economic sanctions, including suspension of Poland's MFN status. The serious economic problems now faced by the East Europeans, while limiting the immediate prospects for East-West trade, would not seem to weaken the power of this policy instrument. Indeed the economic relationship with the West still seems to be viewed by the East European countries as the best hope of overcoming present difficulties and achieving greater prosperity.

The administration has taken the view that economic leverage is most effective when the West presents a united and coordinated approach. The dispute with our allies over the Soviet gas pipeline has demonstrated how far apart the allies were on East-West trade. In the aftermath of that dispute the United States and its allies, who tend to take a more regional than a global view of East-West relations characteristic of the United States, undertook a series of studies in an effort to better coordinate alliance policy on East-West relations.[32] But differences are likely to remain. Because East-West trade has greater economic significance for the allies than for the United States, they are less likely to view it as a weapon and more likely to accept it as an end in itself.

### OTHER MAJOR POLICY INSTRUMENTS

The United States also uses a wide range of other instruments to back up its policy of differentiation in Eastern Europe: political and diplomatic, cultural, scientific, and educational cooperation, information, and international broadcasting. U.S. policy generally favors bilateral over multilateral approaches to Eastern Europe, mainly because the East Europeans are likely to act more autonomously in bilateral context whereas multilateral East-West exchanges are more likely to be dominated by the Soviets.

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[32] U.S. Library of Congress. Congressional Research Service. East-West Commercial Issues in Western Alliance Studies. Issue Brief No. IB83086, May 1, 1983. Washington, 1983; and U.S. Congress. House. Committee on Foreign Affairs. Subcommittee on Europe and the Middle East. Developments in Europe, March 1983. Hearings, 98th Congress, 1st session, March 1983. Washington, D.C., Govt. Print. Off., 1983. pp. 32-34.

One multilateral exchange to which the U.S. has, nevertheless, given priority has been the ongoing Conference on Security and Cooperation in Europe dialogue. However, CSCE has provided a necessary multilateral framework that has in fact opened the door to expanded bilateral relations in security, humanitarian, economic, and other areas.

This administration has continued to place considerable emphasis on international broadcasting efforts toward Eastern Europe. Both the Voice of America and Radio Free Europe/Radio Liberty have been seen as vital communications links to the people of the region and potent weapons in the East-West ideological competition.

## IV. THE CONGRESSIONAL PERSPECTIVE

Congress has over the last decade played a visible role in the conduct of U.S. policy toward the countries of Eastern Europe. Congressional activity has included significant legislation, numerous hearings on general U.S. policy, and on specific issues. Visits to Eastern Europe by Members of Congress have increased high-level official communication between the United States and East European governments. And East European diplomats posted in Washington, finally realizing the key role of Congress in the foreign policy process, have in recent years directed their attention to Capitol Hill. In its policy-monitoring role, Congress has taken a particular interest in human rights considerations and has put pressure on successive administrations to respond to violations of civil and religious liberties in individual countries. Both the House and Senate have been sensitive to the causes of East European-American ethnic groups and have provided them with a forum for airing their views on U.S. policy, and on human rights conditions in specific countries.

The main levers for congressional influence over U.S. policy toward Eastern Europe have been legislation granting or withholding trade benefits (most-favored-nation status, Export-Import Bank and Commodity Credit Corporation credits), export control legislation, appropriations for international broadcasting and other activities related to Eastern Europe, and the Senate's treaty ratification powers. In addition, Congress, through its public hearings plays a major role in shaping U.S. attitudes towards Eastern Europe.

The Trade Act of 1974 had a profound impact on relations with Eastern Europe. The Jackson-Vanik amendment to the act made MFN and credits to Communist countries not yet enjoying preferential trade treatment subject to a determination by the President that, after receiving formal assurances from Communist governments, those countries were allowing free emigration. Congressional approval was required for a presidential waiver. This legislation did not affect Yugoslavia or Poland which already received U.S.

trade preferences so did not fall under the provisions of the act. Poland lost most-favored-nation status in 1981 as a consequence of the government's martial law policies. The restrictions were waived in the cases of Romania (1975) and Hungary (1978). Czechoslovakia, the G.D.R., Bulgaria, and Albania (as well as the Soviet Union) are still subject to the trade restrictions. Because the waiver provision of the legislation requires an annual extension, Congress has established for itself an ongoing monitoring role.[33]

Export control legislation has also had a significant impact on U.S. relations with Eastern Europe. The Export Administration Act amendments of 1979 have encouraged a more multifaceted approach to different countries. They changed the emphasis of national security controls from exports to "communist countries" to exports to "countries which pose a threat to U.S. national security." The effect of this change was to allow the President greater flexibility in applying the controls to individual countries.[34] Now Congress is considering further changes in the export control legislation.

Human rights and emigration, particularly of Jewish minorities, have received considerable congressional attention. Numerous bills have been introduced reflecting concern over human rights violations in East European countries and over the plight of individual human rights and religious activists. In 1976 Congress set up the joint legislative-executive branch Commission on Security and Cooperation in Europe (CSCE) to monitor the implementation of the 1975 Helsinki Final Act with its provisions on human rights and East-West cooperation. Members of the House and Senate were on the U.S. delegation to the Belgrade meeting (1977–78) and the Madrid meeting (1980–1983). Legislation to grant Raoul Wallenberg U.S. citizenship and pressing the Soviet Union to reveal the fate of the Swedish diplomat who saved thousands of Hungarian Jews from Nazi extermination before being arrested by the Soviets at the end of World War II was another expression of the congressional focus on human rights.

The congressional agenda on Eastern Europe in and beyond the 98th Congress will include significant issues involving economic relations. There have been some suggestions that the United States should re-evaluate Trade Act legislation linking MFN and credits to human rights. While there may be some support for eliminating such linkage, current congressional interest seems to focus more on modifications in the waiver provisions to give the President greater flexibility in their application.

With regard to export controls, Congress will have to grapple with the need to ensure that the United States does not weaken its security position through the export to Eastern Europe of vital strategic technology while, at the same time, ensuring that legislation does not simply punish U.S. business by barring U.S. exports, which will otherwise be supplied by U.S. competitors. In this context, it is possible that the Congress may turn its attention to the growing incidence of East European involvement in espionage, notably in the area of high technology.

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[33] For an evaluation of the Jackson-Vanik amendment as a policy tool for congressional oversight, see: Friedman, Wolfgang G. "The Jackson-Vanik Amendment to the Trade Act of 1974: An Assessment After Five Years." Columbia Journal of Transnational Law, v. 18, no. 3, 1980: 525–552.

[34] U.S. Congress. Joint Economic Committee. "Issues in East-West Commercial Relations." Overview by Ronda Bresnick. Washington, U.S. Govt. Print. Off., 1979. pp. 4–6.

A major area which could require further congressional attention involves the serious hard-currency debt problems. This problem arises in the first instance with Poland but could involve other countries. There is a question of whether and under what circumstances and conditions it would serve U.S. interests to provide assistance to individual East European countries to help alleviate the debt problem.

# U.S. LEGISLATIVE FRAMEWORK FOR COMMERCIAL RELATIONS WITH EASTERN EUROPE

By Kate S. Tomlinson*

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## I. INTRODUCTION [1]

U.S. commercial relations with East European countries (and other Communist countries) are subject to restrictions and special provisions not applicable in trade with other countries. All were enacted by Congress, but some, like the export administration system, have been further developed by the Executive based on specific legislative authority. The purposes of these statutory and administrative restrictions fall into three broad categories:

to counter the military and ideological threat posed by the Warsaw Pact and to prevent the diversion of strategic goods and technology to the Soviet Union;

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[1] This paper was originally written for the Centrally Planned Economies Group of Wharton Econometrics Forecasting Associates and was published in 1982. This article is a shorter version of the original and reflects subsequent legislative developments. The author would like to thank Wharton for permission to adapt the paper for inclusion in this volume and Vladimir N. Pregelj for his detailed and valuable comments on the current version. Needless to say, the author retains full responsibility for any errors or omissions.

to influence East European countries' policies and/or to recognize the differences between them and those of the Soviet Union; and

to address economic differences between non-market economy (NME) or state-controlled-economy (SCE) countries and market-economy countries.

The military threat is most directly addressed in the Export Administration Act (EAA), which authorizes the President to restrict exports that would significantly contribute to the military strength of potential adversaries in ways that would be detrimental to U.S. national security. This goal potentially conflicts with another of the Act's goals: to promote exports. Congressional efforts to advance one or the other of these goals have been at the heart of the periodic debates over renewal of the EAA, which expired in 1984.

The goal of influencing East European policies is most apparent in the Jackson-Vanik amendment to the Trade Act of 1974, which denies NME countries most-favored-nation (MFN) trade status, credits from the U.S. Government, and other benefits if they restrict emigration. The amendment does not apply to countries that had MFN status before its enactment and permits the granting of MFN treatment to countries with relatively good emigration records. Since the amendment contains a legislative veto, the *Chadha* decision of the U.S. Supreme Court, which declared legislative votes unconstitutional, raised questions about its administration. This goal is also apparent in export licensing policies, which at times have been slightly more favorable to countries whose foreign or domestic policies were more liberal than those of the Soviet Union.

Differences between non-market and market economies motivated both the market disruption provision of Title IV of the Trade Act of 1974 and the alternative method for determining foreign market value in antidumping proceedings contained in the amended Tariff Act of 1930. The former addresses concerns that Communist countries, unfettered by the disciplines of the market, could flood the U.S. market with goods more quickly than non-Communist countries. It provides U.S. producers with relief from injury caused by rapidly increasing imports from Communist countries only. On the whole, it is less favorable to imports than the escape clause, which has a similar purpose, but applies to imports from all countries. The latter addresses a fundamental problem in determining foreign market value in antidumping investigations of imports from NMEs. Since their prices are not set by the interaction of supply and demand, the standard test for determining foreign market value—the price charged on the home market—cannot be used. Therefore, a different test—the price prevailing in a surrogate market economy—is substituted. The third-country-surrogate test has been criticized as unfair and too complex to administer. Efforts to replace it with a minimum-import-price test failed during the 98th Congress.

The application of the restrictions and special provisions of U.S. law to individual East European countries varies according to their policies and economic structures. The most restrictions are applicable to Albania, Bulgaria, Czechoslavakia, and the German Democratic Republic (GDR), which are generally treated like the Soviet

Union. Thus, U.S. exports to these countries and the Soviet Union are subject to virtually the same controls. None currently have MFN status; nor do they enjoy access to official credits. The fewest restrictions apply to Yugoslavia, which is generally treated like a West European country, but receives certain trade preferences reserved for developing countries. It enjoys unconditional MFN treatment, is treated like West European countries for export licensing purposes, and receives some benefits accorded developing countries. Romania and Hungary are in a middle grouping. They both have MFN status, but it is conditional, subject to the Jackson-Vanik amendment. At times their imports from the United States are subject to slightly looser controls. Romania, moreover, receives some developing country benefits. While Poland technically remains in the same country group as Hungary for licensing decisions, it has been treated more like the Soviet Union since the declaration of martial law. Like Yugoslavia, Poland had had unconditional MFN, but its MFN status and access to official credits were suspended. The applicability of the various statutory provisions is summarized in the Appendix.

## II. U.S. EXPORTS TO EASTERN EUROPE

Throughout the postwar era, the United States has maintained a system of export controls that apply not only to Communist countries, but also to every country except Canada. Exports to non-Communist countries are mainly controlled to prevent diversion to Communist countries.

A response to the deterioration of relations with the Soviet Union, the export control system was formally established in 1949 with the passage of the Export Control Act.[2] Like its successors, the Act empowered the President to control exports to protect national security, to advance foreign policy goals, and to prevent short supply conditions.[3] In the same year, the United States obtained its allies' agreement to create an informal organization, the Coordinating Committee (COCOM), to coordinate Western controls on exports to the Soviet bloc. To encourage West European and, later, Japanese participation in the export control system, the Mutual Defense Assistance Control Act of 1951 (Battle Act) linked continued U.S. aid to cooperation. In the 1950s and early 1960s, U.S. policy amounted to economic warfare, as items that could enhance the economic as well as the military potential of the Communist countries were controlled.

The waning of Cold War tensions, emerging divisions within the Communist bloc, pressures for less restrictive controls by the Allies, persistent U.S. balance of payments deficits, and complaints that less restrictive controls in Western Europe and Japan were placing U.S. business at a disadvantage in competing for markets in Communist countries, fostered a new approach. Instead of focusing exclusively on national security, as the Export Control Act and its successors had, the Export Administration Act of 1969 added an additional goal: export promotion. The tension and potential conflicts between the goals of preserving national security and promoting exports were reflected in amendments to the 1969 Act and in its successor, the Export Administration Act (EAA) of 1979. This tension persists today, forming the boundaries of the debate on amendments to the EAA.

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[2] The United States had used export controls extensively during the War, but not in peacetime. Most of the export controls imposed during World War II were intended to protect the U.S. economy from shortages of materials critical to the war effort. Beginning in early 1948, however, the United States began to apply controls on exports to Eastern Europe for strategic reasons.

[3] For details on the legislative history of export controls, see Harold J. Berman and John R. Garson, "United States Export Controls—Past, Present and Future," *Columbia Law Review*, Vol. 76, No. 5 (May 1976), pp. 791-890, and U.S. Congress, Office of Technology Assessment, *Technology and East-West Trade* (Washington, 1979), Chapter VII.

## A. EXPORT ADMINISTRATION ACT OF 1979 AND 1981 AMENDMENTS

A balancing of the two goals was evident in the findings and policy sections of the Export Administration Act of 1979 (50 U.S.C. App. 2401). For example, the Act stated that U.S. policy is "to use its economic resources and trade potential to further the sound growth and stability of its economy as well as to further its national security and foreign policy objectives." Noting that export restrictions could have adverse effects on the trade balance and employment, the Act declared that it was U.S. policy to minimize uncertainties in the export control system and to encourage trade with all countries unless the President determined that it would not be in the national interest.[4]

At the same time, the Act noted that permitting exports of goods or technology without considering whether they would make a significant contribution to the military potential of potential adversaries might adversely affect national security.

The issue of foreign availability graphically illustrates the tension between the goals of national security and export promotion. Exporters often argue that it is senseless to control goods or technology if they are freely available from other countries. Others argue that national security requires the United States to err on the side of caution, given the difficulty of substantiating claims of foreign availability and of determining whether a good's quality or performance characteristics permit a determination that foreign availability exists.

To address the concerns of both groups, the drafters prohibited the President from imposing national security or foreign policy controls on goods or technology:

> * * * which he determines are available without restriction from sources outside the United States in significant quantities and comparable in quality to those produced in the United States, unless the President determines that adequate evidence has been presented to him that the absence of such controls would prove detrimental to the foreign policy or national security of the United States.[5]

Unlike previous legislation, the 1979 Act explicitly separated national security and foreign policy controls by placing them in different sections (sections 5 and 6).[6] This was a response to those who believed that the Executive had tended to blur the distinction between the two.

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[4] Sections 2 and 3.

[5] Section 4(c).

[6] Arthur T. Downey, "The Export Administration Act of 1979: Law, Policy and Practice," in *Proceedings of the Southwestern Legal Foundation: Private Investors Abroad—Problems and Solutions in International Business* (New York: Matthew Bender & Co., 1980), p. 299.

The new national security controls section authorized the President to control exports that would make "a significant contribution to the military potential of any other country or combination of countries which would prove detrimental to the security of the United States," the same criterion that had been in the 1977 amendments. The 1979 Act also retained the 1977 amendments' injunction that policies towards individual countries not be based exclusively on their Communist or non-Communist status, but should also consider their relations with the United States and with countries hostile and friendly to the United States, and their willingness and ability to control retransfers of U.S. goods and technology.

Like previous legislation, the 1979 Act retained the division of responsibility for national security controls between the Secretary of Commerce and the Secretary of Defense.

The 1979 Act prescribed a new method—the critical technology approach—for determining what should be controlled. Based on a 1976 study by the Defense Science Board, known as the Bucy report, the critical technology approach focuses on the technology that would be transferred through a proposed export rather than the export itself or on its end-user, the traditional focuses of export licensing. It posits that a set of militarily relevant technologies can be identified for control, and that technologies representing a "revolutionary," as opposed to an "evolutionary," advance for the recipient should be controlled. The Secretary of Defense was given primary responsibility for compiling a list of militarily critical technologies (MCTL) specific enough to guide licensing decisions.

The Act added a number of new provisions limiting the President's use of foreign policy controls and giving Congress greater opportunity for oversight. It limited foreign policy controls to one year unless extended by the President. It also required the President to consult with Congress and business before imposing foreign policy controls and to consider the following criteria before imposing, expanding, or renewing foreign policy controls:

> The probability that such controls will achieve the intended foreign policy purpose, in light of other factors, including the availability from other countries of the goods or technology proposed for such controls;
>
> the compatibility of the proposed controls with the foreign policy objectives of the United States, including the effort to control international terrorism, and with overall United States policy toward the country which is the proposed target of the controls;
>
> the reaction of other countries to the imposition or expansion of such export controls by the United States;
>
> the likely effects of the proposed controls on the export performance of the United States, on the competitive position of the United States as a supplier of goods and technology, and on individual United States companies and their employees and communities, including the effects of the controls on existing contracts;
>
> the ability of the United States to enforce the proposed controls effectively; and

the foreign policy consequences of not imposing controls.

After imposing, extending, expanding, or renewing foreign policy controls, the President must report to Congress. The report must contain his conclusions on the six criteria listed above, an explanation of what alternative means had been employed before the imposition of the foreign policy control or why none had been, and an indication of how the control would further U.S. foreign policy or fulfill its international obligations.

In response to exporters' complaints that the processing of applications was too slow, the drafters set—and in some cases reiterated—time limits for each phase of the licensing process.

The 1981 amendments to the EAA (P.L. 97-145) reflected increasing concern on the part of Members of Congress and of the Administration about Soviet efforts to gain U.S. technology illegally. To this end, they increased civil and criminal penalties. Congressional concerns about the impact of the Carter administration's grain embargo on the U.S. reputation as a reliable supplier were not reflected in this legislation, but in an amendment to the Futures Trading Act of 1982 (P.L. 97-444). Known as the "contract sanctity" provision, it prohibits the President from preventing the fulfillment of contracts for agricultural exports signed before the imposition of an embargo if they call for delivery within 270 days. The provision is not applicable if the United States is at war or if the President has declared a national emergency.

### B. DEMISE OF THE EAA

Legislation to amend and extend the EAA passed the House on October 27, 1983 (H.R. 3231) and the Senate on March 1, 1984 (S. 979). The conferees met almost weekly from mid-April to October, but could not resolve all of the differences between the two bills. Disagreements on two issues—a Senate amendment to section 10(g) of the 1979 act and sanctions against apartheid in South Africa (Title III of the House bill)—torpedoed an attempt to pass export control legislation before the end of the 98th Congress.

The amendment to section 10(g) offered by Senator Garn authorized the Secretary of Defense to review license applications for exports to non-Communist countries "where there is a risk, on the basis of reliable evidence, that the goods or technology will be diverted to controlled countries." The Senator intended the Secretaries of Commerce and Defense to agree in advance on what categories of applications the latter would review, with the President resolving any disputes.[7] In the Senator's view, the provision was essential to prevent diversion through Western countries to the Soviet Union and to clarify the intent of Congress with respect to section 10(g) of the 1979 act. Garn argued that section 10(g) authorizes Defense to review any license application, but that Commerce interprets it as authorizing DOD to review applications for exports to Communist countries only. The House bill did not include this provision and the conferees could not resolve the dispute.

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[7] Congressional Record, October 10, 1984, pp. S 14080-14081. (Section 10(g) reads in part: "Notwithstanding any other provision of this section, the Secretary of Defense is authorized to review any proposed export of any goods or technology to any country to which exports are controlled for reasons of national security. . . ." The proposed statement of intent of the committee of conference and of the intent of the House in agreeing to the Senate amendment to H.R. 4230 that Representative Bonker inserted into the record on October 11 stated: "The Defense Department's authority under existing law to review proposed exports to proscribed destinations is adequate to protect national security, and no other authority to review proposed exports to other destinations under this Act is appropriate." (See page H 12156).)

A third area of contention was contract sanctity. The Senate bill included a "pure" contract sanctity clause (Heinz amendment) prohibiting foreign policy controls on exports or re-exports in performance of contracts entered into before the President notifies Congress of his intent to impose controls, while the House bill provided exceptions for actual or imminent acts of aggression, acts of terrorism, and gross violations of internationally recognized human rights.

On October 10, Senator Garn brought up H.R. 4230, a bill to extend the EAA passed by the House in 1983, and added provisions approved in conference. The amended bill, which the Senate approved by voice vote, did not include section 10(g) or a House provision limiting bank loans to the South African Government and its affiliates that had been agreed to in conference. Although the conferees had adopted the Senate language on contract sanctity, the bill offered a compromise allowing retroactive controls if the President certified to Congress that "a breach of the peace poses a serious and direct threat to the strategic interest of the United States" and that the controls would be "instrumental in remedying the situation posing the direct threat." [8] Some Members of both Houses expressed concern that the compromise could undermine the principle of contract sanctity, but were told that "breach of the peace" was intended to be interpreted in only its most narrow sense. The bill also authorized the President to impose investment controls on U.S. firms doing business in South Africa that do not make a "good faith" effort to implement the Sullivan fair employment principles. Senator Garn explained that his amendment on 10(g) was no longer in the bill because it was no longer necessary. This was a reference to a decision by President Reagan to give Defense authority to review certain application for exports to non-Communist countries. Senator Heinz explained that the bill did not include the bank-loan language because of the likelihood of a Presidential veto.

Support for the bank-loan provision was strong in the House. On October 11, the House approved a rule needed to reinsert the provision by a vote of 226 to 124 and passed the amended bill by a vote of 269 to 62. The House bill did not include section 10(g) or the compromise language on contract sanctity. When the bill was returned to the Senate later in the day, Garn explained that he had made the House an offer: Accept section 10(g) and the modified provisions on South Africa or delete both. Since the House version included the bank-loan provision, but not section 10(g), Senator Garn rejected it. The Senate took no further action on the bill or an amendment offered by Heinz that would have reinserted section 10(g). Garn explained that it was too late in the session and referred to substantial opposition in the Senate both to the bank loan provision and 10(g).

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[8] "Proposed statement of intent . . .," pp. H 12154-H 12155. The rest of this account is based on the floor debate. Congressional Record, October 10, 1984, pp. S 14077-S 14083; and October 11, 1984, pp. H 12146-H 12148, H 12162-H 12170; and pp. S 14318-S 14339).

The EAA was originally scheduled to expire on September 30, 1983, but Congress extended it several times. Between October 14 and December 20, 1983, when the EAA was not extended, and again, on March 30, 1984, when the EAA expired a second time, the President invoked the International Emergency Economic Powers Act (50 U.S.C. 1701) to continue export administration. Members of Congress and others were concerned about the potential for legal challenges of actions by the Department of Commerce, particularly license denials and enforcement of the antiboycott regulations. Concern was heightened by a ruling of the U.S. District Court in Seattle in a case that sought to overturn a decision by Commerce by deny Nuclear Pacific, Inc.'s application for an export to an Indian power plant. The Court ruled that legal challenges of license denials are prohibited under the EAA, but not under IEEPA.[9] The Court upheld Commerce's decision on the application, however. Such concerns were one of the motivations for the effort to pass export control legislation before the end of the 98th Congress despite the collapse of the conference.

### C. POLICIES TOWARDS INDIVIDUAL EAST EUROPEAN COUNTRIES

Within the legislative framework established by Congress, the Executive has considerable flexibility in export administration. This is particularly true for policies towards individual countries since the EAA essentially provides only general guidelines. The policies set by the Executive are reflected in a list of country groups to which all countries except Canada are assigned, and in licensing requirements for exports to each country group. Through administrative measures such as changes in the country groups, decisions on individual license applications, or policies on referrals to other agencies, the Executive may tighten or loosen policies towards individual countries.

Within East Europe, the tightest restrictions are applied to Albania, Bulgaria, Czechoslovakia, and the GDR. They are virtually the same as for exports to the Soviet Union. The loosest restrictions apply to exports to Yugoslavia, which was assigned to the same grouping as Western Europe in recognition of Tito's break with the Soviet Union in 1948.

Under the longstanding policy of differentiation, the United States treats more favorably countries whose foreign or domestic policies are more liberal than those of the Soviet Union. As applied to export licensing, this policy resulted in the assignment of Romania, Hungary, and Poland to different country groups than the Soviet Union and the other East European countries, and the approval of some exports that would not be licensed for the Soviet Union.[10]

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[9] *Nuclear Pacific, Inc.* v. *U.S. Department of Commerce* (84-4171 9th Cir. 1984) C84-49R (W.D. Wash. 1984). Another legal issue is the differing criminal penalties for violations contained in the EAA (50 U.S.C. App. 2405) and IEEPA (50 U.S.C. 1705). An effort to amend IEEPA in October 1984 to include the penalties contained in the EAA failed.

[10] A major exception to the relatively more liberal policy for exports to Poland was the Reagan Administration's policy of denying all applications involving high technology and of checking more carefully those involving low technology. This policy, which was designed to prevent possible diversion to the Soviet Union, was in effect from June to November of 1982.

The degree of differentiation in export licensing has varied over time, depending on precedent and overall policy. Many observers believe that the extent of differentiation, particularly in recent years, is so small as to be insignificant.[11] Ultimately, it is bounded by perceptions of the extent to which the East European countries are willing or able to prevent the transfer of U.S. products and technology to the Soviet Union.

## III. U.S. Imports From Eastern Europe

### A. MOST-FAVORED-NATION TARIFF STATUS

Section 402 of the Trade Act of 1974, better known as the Jackson-Vanik amendment, denies nonmarket economy countries most-favored-nation (MFN) status, official credits, and credit and investment guarantees from the U.S. Government, and prohibits bilateral trade agreements if the President determines that they deny their citizens "the right or opportunity to emigrate," or impose more than a "nominal" tax or fee on citizens wishing to emigrate.[12] MFN status has both economic and symbolic importance for East European countries, although its precise importance depends on the extent of their trade relations with the United States. The imports of countries with MFN status are dutiable at Column 1 rates, which reflect substantial tariff concessions negotiated within the framework of the General Agreement on Tariffs and Trade (GATT), instead of the Column 2 rates, set by law in 1930 which are generally significantly higher. Thus, except when Column 1 and Column 2 rates are the same or items are admitted duty-free, MFN status confers economic advantages. Moreover, East European countries attach symbolic importance to receiving the same treatment the United States accords to its other trading partners.

The amendment does not apply to the two East European countries that had MFN status as of January 3, 1975—Poland and Yugoslavia. Poland's MFN status was suspended effective November 1, 1982 under the authority of a different legislative provision. President Reagan acted on the grounds that Poland had failed to fulfill its international trade obligations since 1978 and that the United States had no reason to ignore this failure any longer in light of the Polish Government's suppression of Solidarity. The obligation in question was a pledge by Poland when it acceded to the GATT in 1967 to increase imports from other signatories by a fixed percentage each year. Under the provisions of the Jackson-Vanik amendment, which are described below, MFN status was restored in 1975 to Romania and in 1978 to Hungary.

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[11] U.S. Congress, Office of Technology Assessment, *Technology and East-West Trade: An Update* (Washington, May 1983), p. 37.

[12] There is also a more specific freedom-of-emigration requirement requiring the President to deny MFN status and official credits or guarantees to countries that restrict their citizens' rights to emigrate to join a close relative in the United States. This provision (sect. 409) contains identical operative language and may be regarded as a duplication of sect. 402. (See Vladimir N. Pregelj, "Normalization of U.S. Commercial Relations with Eastern Europe," in U.S. Congress, Joint Economic Committee, "East European Economic Assessment, Part 2—Regional Assessments" [Washington: U.S. Govt. Print. Off., 1981, p. 669, note 5].)

### *1. Jackson-Vanik procedures* [13]

*Restoration of MFN.*—Technically, there are two precedures for the initial step of restoring a country's MFN status. Under the first, the President reports to Congress that the country is not in violation of the freedom-of-emigration requirement. This procedure, which may be called the "primary" procedure, has never been used to grant MFN status to a Communist country and probably could not be since it requires entirely free emigration. The second or "waiver" procedure of section 402 allows the President to waive the freedom-of-emigration requirement if:

> He has determined that such waiver will substantially promote the objectives of this section; and
>
> He has received assurances that the emigration practices of that country will henceforth lead substantially to the achievement of the objectives of this section.

The following steps, in approximately this order, are necessary for restoring MFN:

(1) Bilateral Agreement. The President must negotiate a bilateral agreement providing for mutual nondiscriminatory tariff treatment. Section 405 authorizes him to do so whenever he determines that such an agreement would advance the purposes of the Trade Act and be in the national interest. An agreement may not be for more than three years, but may be renewed for additional three-year periods if the following conditions are met:

> A satisfactory balance of concessions in trade and services has been maintained during the life of such agreement, and the President determines that actual or foreseeable reductions in United States tariffs and nontariff barriers to trade resulting from multilateral negotiations are satisfactorily reciprocated by the other party.

This section also specifies the content of a trade agreement in great detail.[14]

(2) Presidential Proclamation. The President may proclaim a bilateral agreement's entry into force, but it cannot go into effect without Congressional approval.

(3) Transmission to Congress. The President must submit the agreement, proclamation, and a report on the nonmarket economy country's compliance with the freedom-of-emigration provisions. In the last, the President may either report that the country is not in violation (primary procedure) or report that he intends to waive the provision (waiver procedure). If the President intends to use the waiver procedure, the report must contain his determination and a statement that he has received assurances on the emigration.

(4) Congressional Approval. Section 405 stipulates that the agreement and the proclamation can go into effect only if Congress ap-

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[13] The description of the procedures required by the amendment draws heavily on Pregelj, pp. 669-671.

[14] A trade agreement must include the following provisions: (1) the right to suspend or terminate the agreement for national security reasons, (2) safeguards that require consultations when actual or potential imports "cause or threaten to cause, or significantly contribute to market disruption" and authorize import restrictions, (3) no less favorable treatment for U.S. patents and copyrights than that provided for by international conventions, (4) arrangements to protect industrial rights and processes, (5) arrangements for settling commercial disputes, and (6) trade promotion.

proves them by concurrent resolution. Section 151 prescribes the language for the resolution; sets deadlines for each legislative stage; and prohibits debate on or amendments to the resolution. Thus, Congress must act affirmatively to approve the restoration of MFN status and the entry into force of the agreement.

(5) Exchange of Notes. MFN usually goes into effect on the day the United States and the other party exchange notes of acceptance.

*Renewal of MFN.*—The President's authority to waive the freedom-of-emigration provisions and the waiver(s) for individual countries extend for one year. Both the authority and the waivers may be renewed annually if the President determines that renewal would "substantially promote" the objectives of section 402. If he intends to renew a country's MFN status, the President must notify Congress a least 30 days before the authority and the waivers expire. The authority and all of the waivers currently in effect expire on July 3. The submittal must include the President's determination and the reasons why he intends to extend the waiver for each country. Unless either House passes a resolution of disapproval within 60 calendar days after the expiration of the authority and the waivers, i.e., before August 31, renewal is automatic.

Annual renewal of the waiver for Hungary has not been very controversial because its emigration practices, if not its emigration laws, are generally viewed as fairly liberal. But renewal for Romania has often been highly controversial due to its restrictive emigration policies. Resolutions of disapproval have frequently been introduced since 1976, when the waiver for Romania first had to be renewed, but never passed. In 1983, there was a strong possibility that the waiver would not be extended. In February, Romania began to implement a decree announced in the fall of 1982, which required prospective emigrés to reimburse the Government in hard currency for the cost of their education beyond the compulsory level. The tax was clearly in violation of the Jackson-Vanik amendment. On March 4, President Reagan announced that if Romania did not stop applying the tax by June 30, he intended to terminate Romania's MFN status.[15] During the bilateral negotiations that followed, the President received assurances that the Romanian Government would not require prospective emigrés to pay the education tax before leaving. The President, subseqently, extended the waiver for Romania as well as for Hungary. Neither House passed a resolution of disapproval.

The restoration of the MFN status to the other East European countries to which the Jackson-Vanik amendment is applicable—Albania, Bulgaria, Czechoslovakia, and the GDR—is most unlikely, given their current emigration policies and relations with the United States.[16]

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[15] *Weekly Compilation of Presidential Documents,* Vol 19, No. 10, Mar. 14, 1983, p. 337 and "Statement of Mark Palmer, Deputy Assistance Secretary of State for European Affairs Before the Subcommittee on Trade of the House Ways and Means Committee, July 14, 1983," mimeo, pp. 5–6.

[16] Title IV of the Trade Act placed an additional obstacle to restoration of Czechoslovakia's MFN status. The Long-Gravel amendment (sect. 408) required the President to submit to Congress a negotiated claims settlement agreement to replace the one Congress objected to in 1974 as part of any bilateral trade agreement. It also prohibited the President from returning any

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Since several East European countries are GATT signatories, there have been conflicts between U.S. policies on MFN status for Communist countries and U.S. obligations under the Agreement, which stipulates that Contracting Parties must mutually extend MFN treatment. In the case of Czechoslovakia, one of the original signatories, the United States invoked the national security provision of Article XXI when it suspended that country's MFN status four years after the GATT was established. The other Contracting Parties agreed to the mutual non-application of MFN treatment by the two countries. When Yugoslavia and Poland acceded to the GATT, in 1966 and 1967, respectively, there was no conflict since both countries had MFN status. Poland, however, has protested the 1982 suspension of its MFN status by the United States to the other Contracting Parties. The accession of Romania in 1971 and Hungary in 1973 presented difficulties since neither had MFN status from the United States then. The United States invoked Article XXXV, which effectively allows any two members not to grant each other MFN status if one is a new member. After MFN status was restored to Romania and Hungary through the waiver process, the United States continued to invoke Article XXXV as their MFN status is conditional.[17]

### *2. Issues*

The Supreme Court's decision in *U.S. Immigration and Naturalization Service* v. *Chadha* raised the issue of the constitutionality of the procedures for restoring MFN and renewing the waiver authority and the waivers. The decisions handed down on June 23, 1983 in the Chadha case and in two later cases appeared to indicate that all legislative vetos—whether by one House or two—would be considered a violation of the principle of separation of powers and, therefore, unconstitutional. Given the Chadha ruling, it is generally believed that the only permissible legislative method is approval by both Houses, followed by presentment to the President.[18] By this test, concurrent resolutions would not be constitutional, but joint resolutions would since of the two, only the latter must be presented to the President for signature. Since the Jackson-Vanik amendment requires a concurrent resolution for restoring MFN status and permits a legislative veto to the President's renewal of the authority and the waivers, the constitutionality of these procedures might be challenged.[19]

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gold belonging to Czechoslovakia that the United States controlled directly or indirectly without Congressional approval. The claims settlement agreement was subsequently renegotiated and approved by Congress in 1981. Consequently, section 408 is no longer a barrier to restoration of MFN status to Czechoslovakia.

[17] Mark Z. Orr, "Eastern European Participation in the Tokyo Round of Multilateral Trade Negotiations," in *East European Economic Assessment, Part II*, pp. 805-07. Their MFN status is conditional because the United States can only grant them MFN as part of a trade agreement, which is limited to three years, but may be extended for additional three year periods if certain conditions are met. Moreover, their MFN status is subject to annual review under the Jackson-Vanik amendment.

[18] "Statement of Stanley M. Brand, General Counsel to the Clerk, U.S. House of Representatives," in U.S. Congress, House, Committee on Foreign Affairs, "The U.S. Supreme Court Decision Concerning the Legislative Veto." Hearings, 98th Cong., 1st sess., July 19, 20 and 21, 1983 (Washington: U.S. Govt. Print Off., 1983), p. 4.

[19] The decision also raised the question of severability. If the legislation can stand without the legislative veto, the language containing the veto is considered severable, and hence, does not

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To date, the constitutional issue has not been tested. Moreover, there was relatively little debate on this issue during the 1983 and 1984 renewals of the waiver authority and the waivers for the three countries. In 1983 and again in 1984, the Administration reviewed the three countries' emigration records and reported its decision to extend the waiver authority and the waivers to Congress. Congress continued its year-round oversight functions. In 1983, both committees of jurisdiction, the House Subcommittee on Trade and the Senate Subcommittee on International Trade, held the customary hearings on the renewal of the waivers. The House considered, but did not approve, resolutions of disapproval. A resolution disapproving the extension of Romania's MFN status was introduced in the Senate, but was not reported out of the Finance Committee. In 1984, hearings were held only in the Senate; one resolution (disapproving the renewal of MFN for Romania) was introduced, but did not reach the floor of the Senate. The 98th Congress did not amend the Jackson-Vanik provision to limit the authority granted to the President. Nor did it provide itself with a legislative means of influencing the renewal process that could meet the Supreme Court's scrutiny, for example, by substituting a joint resolution for the concurrent resolution, an approach which some observers recommended.

A related issue is extension of multiyear MFN status. During the 98th Congress, Representative Gibbons, the Chairman of the Trade Subcommittee, which holds the annual hearings, introduced two bills to lengthen the waiver period from one to five years. One, H.R. 2603, would apply only to Hungary, the other, H.R. 2770, to Hungary and the PRC. Supporters of multiyear MFN argue that reviewing a country's compliance every year is time-consuming and unproductive. Many of them believe that multiyear MFN would give nonmarket-economy countries a greater incentive to comply with the freedom-of-emigration provisions, particularly if the President were authorized to suspend the grant if conditions warranted. Opponents of the idea do not accept this argument. Some members of the business community support multiyear MFN as a way of facilitating the planning of long-term commercial relations. The governments of Communist countries subject to the waiver process would prefer renewal at less frequent intervals for symbolic and commercial reasons.

In addition to its impact on emigration, multiyear MFN raises another policy issue, which is suggested by the content of the bills introduced by Representative Gibbons: Romania is conspicuously absent from both. While approval of multiyear MFN for Romania would be extremely unlikely at present, granting multiyear MFN to one or two countries could have an adverse impact on U.S. relations with the other(s).

Hearings were held, but no further action was taken on the bills.

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invalidate the legislation in which it is embedded. The actions of the Administration and the Congress during the the two annual renewals of the waiver authority and the waivers following the Chadha decision indicate that the question of severability was not a major issue in this case, however.

## B. IMPORT RELIEF

Measures that can be taken to counter the injurious effects on the U.S. economy of imports differ in several important ways depending on whether they are from East European (and other Communist countries) or non-Communist countries. These distinctions, most of which are embodied in statute, take into account differences between state-controlled and market economies.

### *1. Market disruption*

The market disruption provisions of section 406 of the Trade Act of 1974 (19 U.S.C. 2436) are applicable only to "Communist countries," which are defined as "countries dominated or controlled by Communism."[20] Section 406 was passed in the anticipation that trade with the Communist countries would increase due to the improvement in U.S.-Soviet relations and the Trade Act's authorization of MFN status for Communist countries not yet accorded such treatment. Congress was concerned that Communist countries, "through control of the distribution process and the price at which articles are sold," could direct exports "so as to flood domestic markets within a shorter time period than could occur under free market condition[s]."[21]

Section 406 is in many ways an adjunct to the U.S. escape clause law, section 201 of the same Act (19 U.S.C. 2251(b)), which is applicable to imports from all sources. Section 406 refers to and adopts many of the definitions and procedures in section 201. Both provisions provide U.S. producers with relief from increasing imports. Both rely solely on an injury test; that is, the imports must be judged to be "injurious" not necessarily "unfair." Both are "discretionary" in the sense that the President has the option of rejecting or modifying the relief recommended by the U.S. International Trade Commission (USITC).[22]

The similarities notwithstanding, the market disruption provisions reflect Congress' special concern about trade with Communist countries. In comparison with the escape clause, its injury and causation tests are more easily satisfied. The test for increased imports, which requires that their growth be "rapid," is tougher than of the escape clause, however. It reads as follows:

> Market disruption exists within a domestic industry whenever imports of an article like or directly competitive with an article produced by a domestic industry, are increasing rapidly, either absolutely or relatively, so as to be *a significant cause of material injury* or threat thereof, to such domestic industry. (Emphasis added.)

In contrast, the standard in an escape clause investigation is a simple increase in imports, which is found to be a "substantial cause" of "serious injury" or of a threat of such injury. Second, USITC is required to make an injury determination within three months in a market disruption investigation, but has six months in an escape clause case. Third, under the market disruption clause, only imports from the Communist country cited are considered, and the remedy applied only to imports from that source. Under the escape clause, however, imports from all sources may be considered, and the remedy generally must be applied to imports from all sources. Fourth, the market disruption provision, but not the escape clause, authorizes the President to take emergency action by imposing quotas or other import restrictions before USITC finishes its investigation. Fifth, if the President chooses an orderly marketing agreement as the remedy, it must be entered into within 60 days as opposed to the 90 days allotted by the escape clause.[23]

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[20] The other sections of Title IV, however, apply to "non-market economy countries."

[21] "Trade Reform Act of 1974: Report of the Committee on Finance. . ." S. Rept. No. 93-1298, 93rd Cong., 2nd sess. (1974), p. 210.

[22] The discretion granted to the President under the Trade Act is not complete. If he decides not to grant relief or to take action that differs from that recommended by USITC in a market disruption or escape clause case, Congress has the option of passing a resolution which nullifies the President's decision by forcing the implementation of the action recommended by the Commission. Since the mechanism specified in the Trade Act was a concurrent resolution, Congress changed it to a joint resolution, (section 248 of the Omnibus Trade Act of 1984).

The market disruption provision may offer industry a quicker and easier method for obtaining import relief than the escape clause when imports from a Communist country are involved, but strategy requires that a Communist country be the major supplier. Given the relatively low level of imports from Communist countries, such situations are probably uncommon. Since the enactment of the market disruption provision in 1975, it has been the basis of ten investigations involving seven different products. Only three of the investigations involved East European products—clothespins from Romania and Poland and unrefined montan wax from the GDR. The most common basis for petitions for relief from imports from Communist countries is the antidumping provisions of the Tariff Act of 1930.

### *2. Dumping*

U.S. producers are protected against injurious imports sold at "less than fair value," i.e., dumped, by the Tariff Act of 1930, as amended. Title VII provides for the addition of an antidumping duty equivalent to the difference between the price at which the merchandise is being sold in the United States and its fair value if sales are "causing or threatening to cause material injury to an industry in the United States, or if the sales are materially retarding the establishment of a domestic industry."

The dumping provisions are applicable to any country, but the method used to determine foreign market value depends on whether the foreign producer is located in a market-economy country or a state-controlled-economy (SCE) country.[24] In the first case, foreign market value is determined by referring to one of the following criteria:

> The price at which the producer sells the product in his home economy,

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[23] Section 406 also provides that U.S. entities may petition the President to use the safeguard provisions that section 405 requires be included in trade agreements with Communist countries. If he determines that there are "reasonable grounds" to believe that market disruption exists, he is to initiate consultations with the governments involved.

[24] "Fair value" and "foreign market value" are two different concepts. The first is used to determine whether dumping has occurred and to calculate the antidumping duty if the U.S. sales value is not "fair," while the second is used to determine whether the U.S. sales value is "fair."

The price at which the producer sells the product in countries other than the United States, or

The producer's costs of production to which set amounts for general expenses and profits are added.

In the case of SCEs, however, the legislation recognizes that prices are generally not determined by supply and demand, but are administered. Therefore, foreign market value is determined differently. Following U.S. administrative procedure since the 1960s and previous legislation,[25] section 773(c) of the Tariff Act of 1930, (19 U.S.C. 1677b) provides a "third country" test. Under this test, foreign market value is determined by referring to the prices or costs of a producer in a surrogate market economy. It may be determined in one of the following three ways:

The price at which the third country surrogate sells the product on its home market,

The price at which the surrogate producer sells the product to other countries, including the United States, or

The constructed value of the product in a non-state-controlled-economy.

One of the these methods is to be used if the producer's economy "is State-controlled to an extent" that the primary method of determining foreign market value cannot be used. Commerce Department regulations express a preference for the prices charged by a third country surrogate over constructed value based on a surrogate producer's costs.

In determining whether an economy is state controlled, the Secretary of Commerce considers the following factors:

The extent to which prices are permitted to fluctuate in response to supply and demand, the extent to which the exchange rate reflects the appropriate relative value of the country's currency,[26]

and other factors considered appropriate for the specific case. It is generally assumed that the East European economies (with the possible exception of Yugoslavia) would be considered state-controlled, and thus subject to the provisions of section 733(c). In a 1981 petition against truck trailer axle-and-brake assemblies produced at the Raba plant in Hungary, it was argued that the Hungarian economy should not be considered state-controlled, but the Commerce Department was not convinced. It treated Hungary as an SCE for the case at hand, but left open the possibility that it might be considered a free-market economy in future investigations.[27]

The section 733(c) antidumping provisions have been criticized by non-governmental experts, officials of the agencies responsible for administering them, and by non-market economy countries. The most basic criticism is that an SCE country cannot control or know the fair value in advance since it depends on the Commerce Department's future choice of a surrogate country. In contrast, companies in market economies can determine the fair value in advance and avoid allegations of dumping. U.S. import competing industries are similarly ignorant of what the fair value will be, a disadvantage which is thought to deter some smaller companies from filing petitions.

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[25] "Dumping by State-Controlled-Economy Countries: The Polish Golf Cart Case and the New Treasury Regulations," University of Pennsylvania Law Review, Vol. 128 (November 1979), pp. 220–24. The previous legislation, which was repealed by the Trade Agreements Act of 1979, was section 205(c) of the Antidumping Act of 1921, as added by the Trade Act of 1974.

[26] U.S. Congress, Joint Economic Committee, "East-West Commercial Policy: A Congressional Dialogue with the Reagan Administration," 97th Congress, 2nd session, Feb. 16, 1982 (Washington: U.S. Govt. Print. Off., 1982), p. 36.

[27] 46 FR 46152.

Fair value itself is viewed as arbitrary due to the methodological and practical difficulties of selecting a surrogate producer. The goal is to find a market-economy country resembling in economic structure and development the SCE in question. This is difficult enough, but further problems arise since industries or producers in economies at similar levels of economic development may not be comparable.[28] The choice of O/CAVA in Italy as the surrogate producer in the Raba case has been criticized on these grounds. It should also be noted that potential surrogate producers have no particular incentive to provide the U.S. Government with cost and price data since they are not parties to the case. The problems involved have been summarized by the head of the Department of Commerce's Office of Import Administration, which is responsible for selecting surrogate producers:

> The current system of handling dumping from non-market economies yields totally random results which have no connection to reality . . . (t)here is no such thing as a comparable economy. So in theory it is nonsense, but in practice it is is even worse because you have to find someone who will give you information which they have no interest in the world in giving to you.[29]

However the surrogate is selected, the third-country test has been criticized on the grounds that it ignores the possibility that the SCE producer may in fact be the least-cost producer. The alternative method, constructed value, also poses methodological and practical difficulties. It may yield a value higher than the actual cost of production since the law establishes minimums for profit and administrative expense.

Widespread dissatisfaction with the antidumping provisions for imports from SCE's has led to proposals by Members of Congress and others for reform. The 98th Congress considered, but did not adopt, proposals by Senator Heinz and Representative Gibbons to replace the surrogate producer approach with a lowest-average-price test for dumping.[30] Lowest-average-price proposals met with

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[28] This point has been raised by Senator Heinz, among others. (See Congressional Record, May 24, 1983, p. S7355.)

[29] "Statement of Gary N. Horlick, Deputy Assistant Secretary for Import Administration, U.S. Department of Commerce," in U.S. Congress, House, Committee on Ways and Means, Subcommittee on trade, Options to Improve the Trade Remedy Laws, Part II, Hearings, 98th Congress, 2nd session, March 16, 17; April 13, 14, 19; and May 4, 11, 1983 (Washington, U.S. Government Printing Office, 1983), p. 560.

[30] The Heinz bill (S. 1351), which was not reported out of committee, was a variant of S. 958, a bill introduced by the Senator during the 97th Congress. S. 1351 would not have completely eliminated the surrogate-producer concept since its test was the "lowest average price of the *most suitable* U.S. producer in arms-length sales to customers in the United States . . . or the lowest average price of the *most suitable* foreign producer in the market economy in arms-length sales to customers in the United States . . .," whichever was lower. (Emphasis added.) S. 1351 was not reported out of committee. The Gibbons proposal was included in the Trade Reme-

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two general criticisms: One was that adoption of this standard would allow inefficient NME producers to lower their prices to the level that would be set by a low-cost, high-volume producer, which would not reflect their costs of production, but would allow them to avoid dumping allegations. The second criticism addressed the opposite case, that of an efficient NME producer. Thus, it was argued, the lowest-average-price standard would not allow such a producer to sell in the United States at a price reflecting his true comparative advantage.[31] Senator Heinz later changed the price test to the "trade-weighted average price of eligible market economy foreign producers" in sales to the United States, a higher price standard. He reintroduced the modified proposal as an amendment to the Trade and Tariff Act of 1984 (H.R. 3398). The Senate approved the amendment on September 18, 1984, but it was deleted in conference.

### *3. Export subsidies*

The potential applicability of countervailing duty (CVD) law has long been of interest to lawyers and specialists in nonmarket economies, but no petition alleging export subsidization by NME governments was filed until late 1983. The first petition, which involved Chinese textiles and apparel exports, was withdrawn without a resolution of the issue, but later that year petitions alleging subsidies of carbon steel wire rod exports by the Czechoslovakian and Polish Governments were filed. The relevant statute, section 303 of the Tariff Act of 1930, was potentially applicable to NME's since it referred to "bounties or grants" by any political entity.[32] Many specialists, however, questioned whether Congress intended CVD law to be applied to NME's and, if so, whether subsidies could be identified, much less measured, in an NME. In May 1984, the Commerce Department ruled that subsidies within the meaning of section 303 could not be found in NME's. Defining a subsidy as "any action that distorts or subverts the market process and results in a misallocation of resources . . .," the drafters of the determination argued that it was meaningless to apply this concept to an NME where resources are not allocated by the market, but by planners. In the case of an NME, it would be impossible to identify

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dies Reform Act of 1984 (H.R. 4748), but was deleted during subcommittee markup. Its price test was the "lowest average price . . . charged for like articles in the United States by all producers from the United States or any non-State-controlled-economy countries" (except those found to be selling at LTFV or receiving export subsidies.)

[31] For background on these points, see the Subcommittee on Trade's report on H.R. 4748 (WMCP: 98-26) and "Testimony of Lionel H. Olmer, Under Secretary of Commerce for International Trade, before the International Trade Subcommittee of the Senate Finance Committee on S. 1351, May 7, 1984."

[32] Under the Tariff Act of 1930, different provisions are applicable to "countries under the Agreement" and other countries. Section 303 (19 U.S.C. 1303) is applicable to the latter group, which includes the East European countries (and other Communist countries). Title VII of the Tariff Act (19 U.S.C. 1671) applies to countries under the Agreement, which with a minor exception are those that have acceded to the GATT Agreement on Subsidies and Countervailing (Subsidies Code) or have undertaken "substantially similar" obligations vis-a-vis the United States (19 U.S.C. 2503(b)). Since Czechoslovakia and Poland have not acceded to the Subsidies Code, the investigations were conducted under section 303. This section does not require a determination that a U.S. industry "is materially injured, or is threatened with material injury, or that the establishment of an industry in the United States is materially retarded" by the imports under investigation unless the imports are duty-free. In contrast, Title VII requires an injury determination before the imposition of countervailing duties regardless of whether the imports are dutiable or not.

a subsidy in the usual manner—by comparing the treatment the firm would receive in the marketplace with the treatment it receives from the government. This, they argued, every government action would have to be considered a subsidy (or a tax if it harmed the enterprise).[33a] Commerce's decision has been appealed.

### C. GENERALIZED SYSTEM OF PREFERENCES

Under the Generalized System of Preferences (GSP), a large number of products from developing countries enter the United States duty-free. The preference, which has been in effect since January 1976, was extended to July 4, 1993 by the Trade and Tariff Act of 1984 (P.L. 98-573). Romania and Yugoslavia met the eligibility criteria set in the legislation that established GSP, Title V of the Trade Act of 1974 (19 U.S.C. 2461), and have been designated "beneficiary developing countries" (BDC's).

The statute specifies certain criteria that the President may not waive in designating a country a BDC. The first requirement for designation is that the country not be listed as ineligible in section 502(b) of the Trade Act (19 U.S.C. 2462(b)). The statute provides no explicit explanation for the exclusion, but these countries were presumably excluded because they were considered developed.[33b] Several East European countries (Czechoslovakia, East Germany, Hungary, and Poland) were listed, but section 503(b) of the Trade and Tariff Act of 1984 deleted Hungary from the list.

Section 502 of the Trade Act of 1974 contains another unwaivable obstacle to the designation of Communist countries: The President may not designate otherwise eligible Communist countries unless they have been granted MFN status by the United States; are members of GATT and the IMF; and are not "dominated or controlled by international communism." There are other obstacles to the designation of a Communist country, but they are potentially applicable to non-Communist countries as well and the President may waive them, if he determines that designation is in the "national economic interest" and reports this determination to Congress.[34]

## IV. Financing of U.S. Exports

### A. OFFICIAL CREDITS AND CREDIT GUARANTEES

The primary obstacle to the extension of official credits and guarantees for exports to East European countries is the Jackson-Vanik amendment (see Section III). For Eastern European countries, whether they are subject to the Jackson-Vanik amendment or not, there are additional obstacles to access to financing from the Export-Import Bank (Eximbank). These obstacles have not proved insurmountable for otherwise eligible countries.

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[33a] 49 FR 19370. In light of the decisions in the wire rod cases, Commerce rescinded the two other investigations that had been initiated against NME imports (potassium chloride from the GDR and the Soviet Union).

[33b] H. Rpt. No. 93-571, p. 84.

[34] The mandatory, but waivable, criteria may be found in paragraphs 4-7 of the section. The Trade and Tariff Act added a fifth such criterion, prohibiting the extension of GSP benefits to any country that has not taken or is not taking steps "to afford internationally recognized workers' rights."

The Export-Import Bank Act of 1945, as amended, prohibits Eximbank's participation in any lending to a Communist country unless the President determines that it is in the U.S. national interest and reports this determination to Congress.[35] Presidential determinations have been made for all eligible East European countries—Yugoslavia, Romania, Poland, and Hungary. In addition, a separate national interest determination by the President is required for each loan, guarantee, or combination of loans and guarantees of $50 million or more for exports to a Communist country.

In addition, the Eximbank statute contains a number of restrictions applicable to Communist as well as to non-Communist countries. One requires the President to report to Congress at least 25 days before the final approval of any loan, guarantee, or combination of both exceeding $100 million. Another directs Eximbank's Board of Directors to consider the human rights record of any country that would receive exports supported by Eximbank credit or guarantees and the impact of the proposed sale on human rights in the importing country. The Board, however, is not to reject applications on non-commercial grounds unless the President determines that denial would importantly advance U.S. policy on human rights and other issues.[36]

For the Commodity Credit Corporation's (CCC) standard credit and guarantee programs, there are no additional statutory barriers or limitations for East European countries.[37] All of them have used CCC programs.

Poland has been denied access to official credits and guarantees from Eximbank and CCC as part of President Reagan's sanctions policy. Although a related sanction—U.S. refusal to renegotiate Poland's official debts—was lifted in November 1983, this sanction has been retained to demonstrate U.S. disapproval of the Jaruzelski government's human rights policies. Even if the President were to lift the sanction, Poland might not necessarily obtain new credits and guarantees because of its financial difficulties. Eximbank policy requires a "reasonable" assurance of repayment for each proposed transaction. The CCC appears to have a similar policy. Thus, during 1982, both institutions also curtailed operations in Romania in the wake of the financial crisis there.[38]

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[35] This provision has been part of the Export-Import Bank Act since the 1968 Amendments. It originated in Title III of the Foreign Assistance and Related Agencies Appropriations Act, 1964 (Public Law 88–258).

[36] The requirement to consider human rights was added to the Export-Import Bank Act by the 1977 amendments (Public Law 95–143), but was amended the following year by Public Law 95–630.

[37] Public Law 480, the Agricultural Trade Development and Assistance Act of 1954, does bar most Communist countries from participating in the programs it authorizes. These programs, however, are primarily intended for developing countries with annual per capita incomes of less than $690. (The law requires that 75 percent of Public Law 480 funding be earmarked for such countries.) Yugoslavia and Poland have been Public Law 480 beneficiaries—the latter as recently as 1980—but have been receiving declining amounts in recent years.

[38] Congress adopted a special provision affecting repayment by the CCC of guaranteed loans in fiscal years 1982 through 1984. It prohibits the use of CCC funds for this purpose unless Poland is declared to be in default of payments on these loans or the President provides Congress with a monthly written explanation of how not declaring Poland in default advances the U.S. national interest.

### B. PRIVATE FINANCING

The Johnson Debt Default Act of 1934 is sometimes mentioned as a barrier to U.S. private credit to certain East European countries. This Act, which is still in force, prohibits U.S. citizens from making loans to or buying or selling the securities of a country in default on its obligations to the U.S. Government. Subsequently amended to exempt countries that are members of both the International Monetary Fund and the World Bank, it is thought to be applicable to Poland, Czechoslovakia, and the GDR. In practice, the Act is not a barrier to lending by U.S. financial institutions since opinions by three Attorney Generals have held that it does not apply to normal commercial credit.[39] Moreover, it does not apply to transactions undertaken in conjunction with a U.S. public corporation (e.g., loans guaranteed by Eximbank or the CCC).

## V. INVESTMENT GUARANTEES

To a limited degree the programs of the Overseas Private Investment Corporation (OPIC) are relevant to U.S. commercial relations with Eastern Europe. OPIC was established to promote and insure U.S. private investment in developing countries friendly to the United States. As a result of several East European countries' unwillingness to allow foreign direct investment and the stringent requirements set by the Foreign Assistance Act of 1961 (FAA), OPIC operates in only two East European countries—Romania and Yugoslavia.

Both countries met statutory requirements that apply only to Communist countries—the Jackson-Vanik amendment's denial of guarantees, including investment guarantees, to many NMEs and the FAA's prohibition on aid to Communist countries. As discussed in section III(A), the restrictions contained in the Jackson-Vanik amendment do not apply to countries like Yugoslavia that had MFN status as of January 3, 1975 or received MFN under the waiver process as did Romania. Under the FAA, the President may grant aid, including the operation of OPIC programs, to Communist countries if he determines that:

> the assistance is vital to U.S. security;
>
> the recipient country is not controlled by "the international Communist conspiracy"; and
>
> the recipient's independence from international communism would be furthered;

and reports these determinations to Congress. In 1972, this requirement was amended for Yugoslavia and Romania to a simpler Presidential declaration that the exception would be in the national interest. Finally, both countries have been determined to be "friendly" and "developing" for the purposes of OPIC programs.[40]

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[39] Pregelj, p. 677.

[40] Pregelj, pp. 678–79. The FAA does not set any criteria for defining "friendly" and "developing."

# APPENDIX

## TABLE 1.—U.S. COMMERCIAL RELATIONS WITH EAST EUROPEAN COUNTRIES

| | Albania | Bulgaria | Czechoslovakia | German Democratic Republic | Hungary | Poland | Romania | Yugoslavia |
|---|---|---|---|---|---|---|---|---|
| Export control group [1] | Y | Y | Y | Y | W | W | Q | V |
| MFN status | | | | | X | (2) | X | X |
| Statutory | | | | | | | | X |
| Subject to freedom-of-emigration provision | | | | | X | | X | |
| Market disruption provision | X | X | X | X | X | X | X | X |
| SCE procedure in dumping cases | X | X | X | X | X | X | X | |
| GSP treatment | | | (3) | (3) | | (3) | X | X |
| Eligibility for: | | | | | | | | |
| Official credits and guarantees | | | | | X | | X | X |
| OPIC programs | | | | | | | X | X |
| GATT signatory | | | X | | X | X | X | X |
| Member of World Bank and IMF | | | | | X | | X | X |

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[1] For an explanation of these groupings, see section II-C.

[2] Poland's MFN status (statutory) was suspended.

[3] Listed as developed countries in the legislation and, hence, automatically ineligible.